MOTOR AGE

Vol. XXXI
No. 23

CHICAGO, JUNE 7, 1917

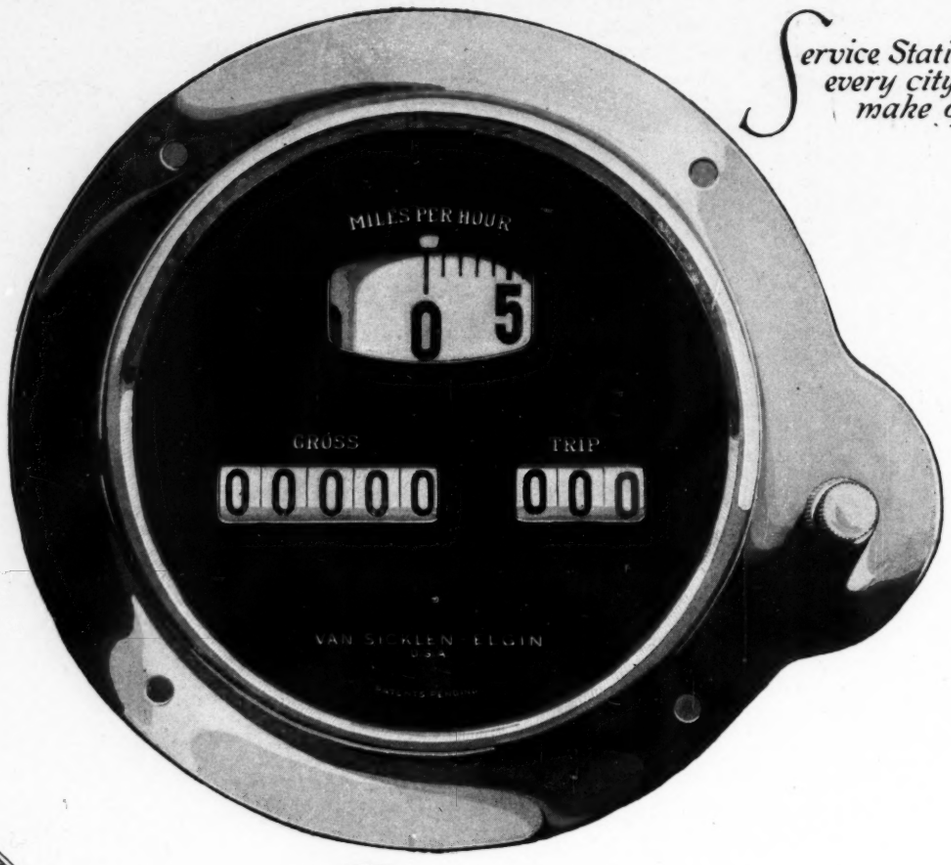
Ten cents a copy
Three dollars a year

Editorial Contents—Page 3

Advertisers' Index—Next to Last Page

In This Issue—Cincinnati Speedway Race

Service Stations in practically every city in which your make of car is sold



Van Sicklen

ELGIN SPEEDMETERS

Predominant as the only instruments which indicate speed-per-hour on a scientifically correct basis.

Prices and Specifications Mailed on Request

The Van Sicklen Company — Elgin Illinois
Factory — Elgin National Watch Co.

MOTOR AGE

Published Every Thursday by the
CLASS JOURNAL COMPANY
Mallers Building
CHICAGO ILLINOIS

Entered as Second-Class Matter September 19, 1899, at the Postoffice at Chicago, Illinois, Under Act of March 3, 1897—Member of the Audit Bureau of Circulations—Copyright, 1917, by the Class Journal Co.

United States, Mexico and U. S. Possessions One Year $3.00
Canada .....One Year $5.00
All Other Countries in Postal Union.....One Year $6.00

BEWARE OF SUBSCRIPTION SOLICITORS OFFERING PREMIUMS OR CUT RATES—ALL CURRENCY SHOULD BE SENT BY REGISTERED MAIL.

RENEWALS or CHANGES OF ADDRESS should be sent two weeks in advance of date they are to go into effect. Be sure to send old as well as new address to avoid unnecessary delay. RECEIPT of first copy is acknowledgment of subscription.

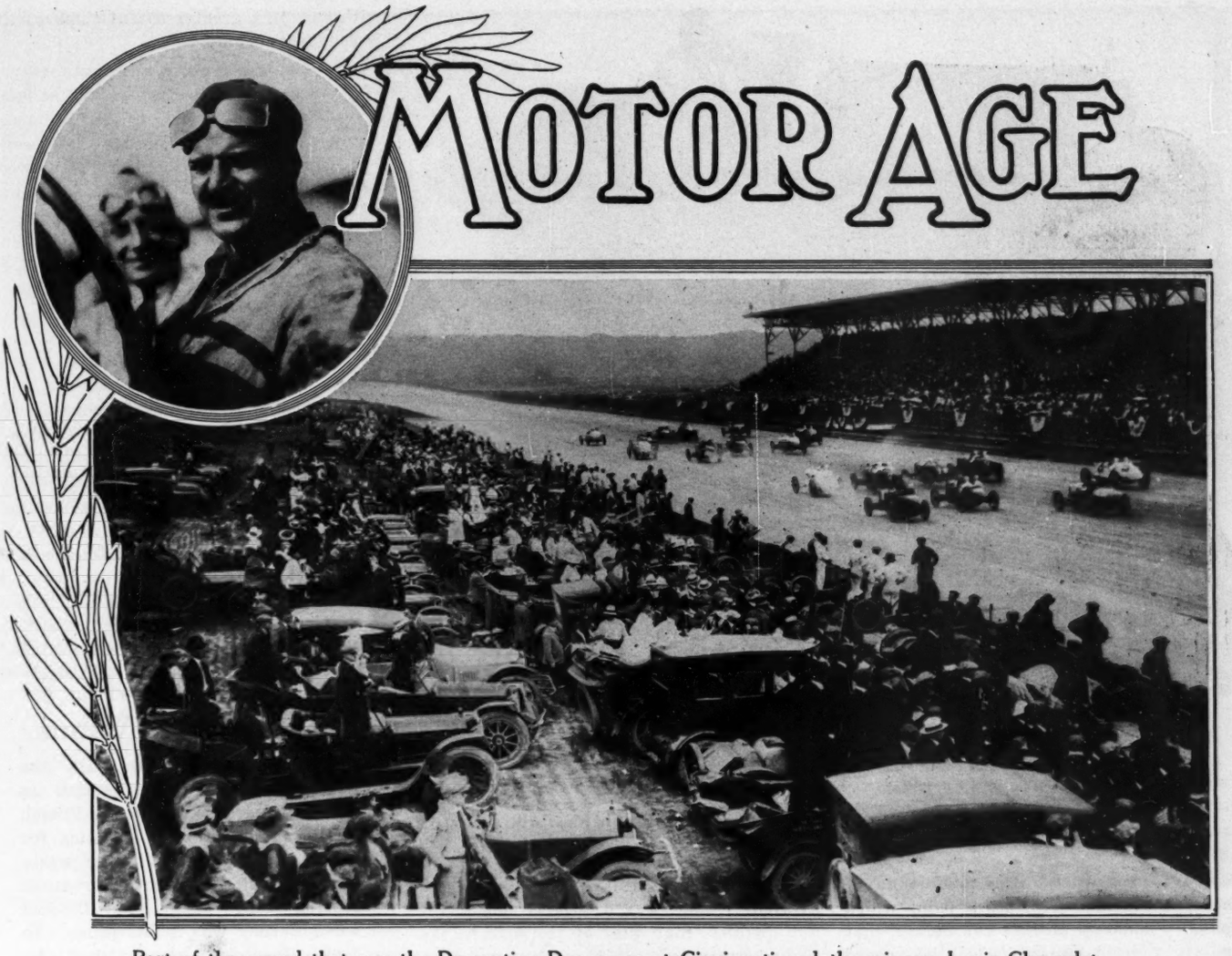
Vol. XXXI Chicago, June 7, 1917 No. 23

Contents

ANNOUNCEMENT

This week we learn that the United States Army is to buy all motor vehicles through the Chicago depot. At the same time we learn that units of drivers are being mobilized for training in schools and in ambulance service camps. Next week Motor Age will tell of the great motor supply department of France. Read it and see how Europe does it.

Vol. XXXI, No. 23 Chicago, June 7, 1917 $3.00 Per Year



Part of the crowd that saw the Decoration Day races at Cincinnati and the winner, Louis Chevrolet

Louis Chevrolet Victor at Cincinnati

By Darwin S. Hatch

Wins Memorial Day Event in Frontenac at 102.18 M. P. H.—Vail in Hudson, Second and Gaston Chevrolet, Third—Ford Averages 63 M. P. H. for 20 Miles on Board Track

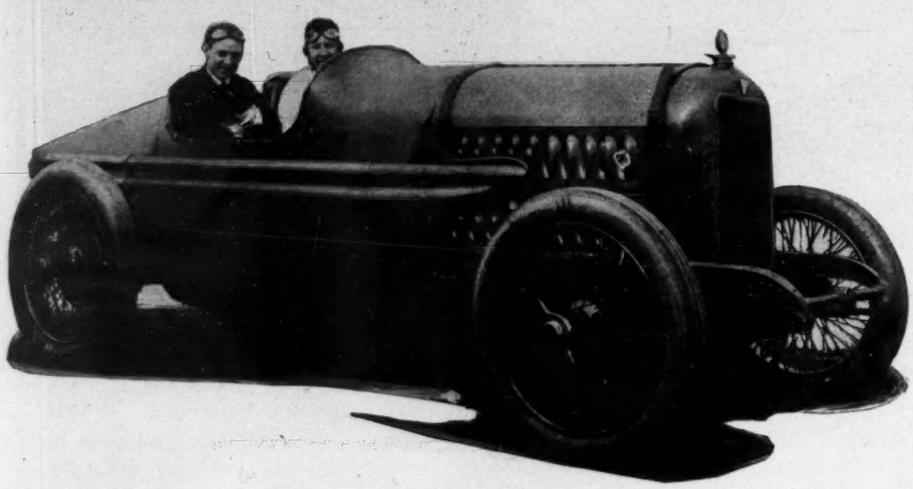
CINCINNATI, Ohio, June 1—Louis Chevrolet in a Frontenac captured the feature event of 250 miles in the Memorial day meet on the Sharonville track. His speed for the distance averaged 102.18 m.p.h. for the 250 miles, which is only slightly less than the American speedway record made by Gil Anderson in a Stutz at Sheepshead Bay in 1915. His time was 2 hrs. 26 min. 47.90 sec. Second place was captured by Ira Vail in a Hudson, who followed the veteran across the wire by only a few seconds over a minute. Louis' brother, Gaston Chevrolet, in a sister Frontenac, took third place after a neck-and-neck fight for the last 150 miles, and pushed Vail so close that early announcements have him finishing in second place.

For the first 150 miles, Ralph de Palma in a Packard twin six, led the field easily, averaging better than 101 m.p.h. and seemingly with plenty of extra speed up his sleeve, which was attested by the fact that he qualified at a speed better than 109 m.p.h. in the elimination trial. With the race more than half over and his car running like a watch well in the lead, de Palma's inevitable hoodoo overcame him when a large splinter torn up from the track pierced his radiator and after several attempts to stop the loss of water, he was

Official Cincinnati Race Times

No.	Car.	Driver.	Time.	M.P.H.	Prize.
1	Frontenac	Louis Chevrolet	2:26:47.90	102.18	$10,000
14	Hudson	Ira Vail	2:27:57.44	101.38	5,000
24	Frontenac	Gaston Chevrolet	2:28:45.73	100.08	2,500
7	Duesenberg	Tom Milton	2:32:47.55	98.1	1,750
51	Duesenberg	Eddie Hearne	2:34:17.36	97.2	1,500
5	Stutz	Earl Cooper	2:34:28.47	97.1	1,100
17	Hudson	E. H. Patterson	2:35:48.05	96.2	900
22	Ogren	Otto Henning	2:35:49.66	96.2	800
9	Hudson	Ralph Mulford	2:38:05.05	94.9	750
29	Omar	Omar Toft	2:39:28.92	94.05	700
27	Delage	Barney Oldfield	2:39:51.65	93.8	

Louis Chevrolet, Cincinnati winner, and his victorious Frontenac



Ira Vail, second at Cincinnati, in the mechanic's seat and Ralph Mulford, ninth, at wheel of Hudson

forced to withdraw. The misfortune of the speedy Italian clinches a point which has been made by MOTOR AGE before, that radiator guards are needed on board tracks.

Three Events

Chevrolet's victory was the third event of a series of three as staged for the Decoration day meet. The other two included a Ford Invitation event for 20 miles which was won by J. H. Stewart of Cincinnati. There were twelve starters in this race, all of them Fords, and several fitted with the Roof sixteen-valve engine. It is worthy of note that the first four places were taken by the sixteen-valve Fords. Stewart's time for the 20 miles was 19 min. 0.61 sec.—an average of 63.13 m.p.h., which is going some for a Ford.

The second event on the card was a free-for-all, non-stock, special invitation event for the Cincinnati Enquirer trophy. It was open to all cars regardless of displacement, but no drivers of cars entered in the big events — the sweepstakes — were eligible. This was for a distance of 30 miles and was won by J. Rothart in a Hudson Super-Six at a speed of 87.9 m.p.h. The speed probably would have been considerably higher had Rothhart found it necessary to step on the throttle, but in the field of five starters, there was only one which offered any competition. This was a Paige driven by Joe Nikrent who returned to the racing wheel after a hiatus of several years. Nikrent's time was 3½ min. slower for the distance than that of the winner, the Paige averaging 81.53 m.p.h. At that, Nikrent was way ahead of the rest of the field.

Racing fans who believe in signs may take the tip that in the Cincinnati event, each one of the three races was won by car No. 1.

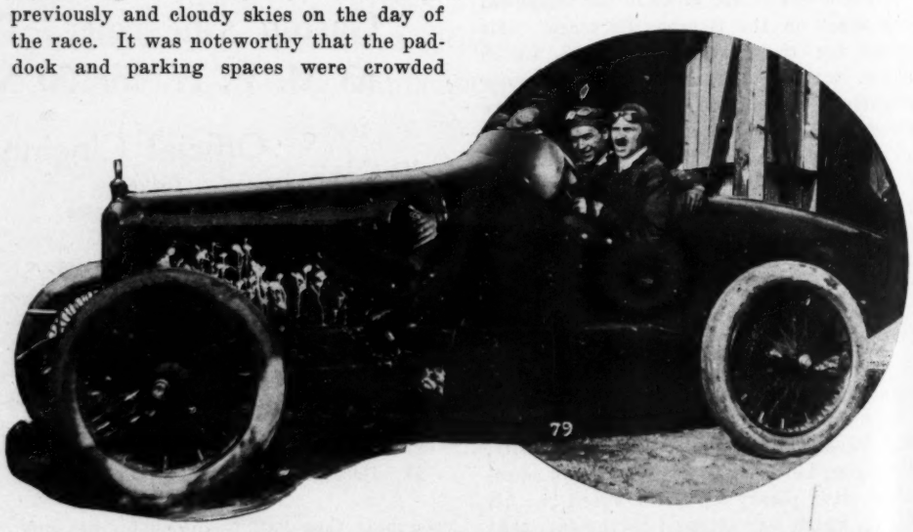
There was an exceptionally good attendance, numbering in the neighborhood of 40,000 in spite of steady rains several days previously and cloudy skies on the day of the race. It was noteworthy that the paddock and parking spaces were crowded with cars to a greater extent than usually is found at a race.

The crowd as a whole was demonstrative and enthusiastic and in Cincinnati at least, there is little evidence of loss of popular interest in speedway races. The crowd rose to its feet for the brushes between de Palma and Louis Chevrolet for first, and Gaston Chevrolet and Vail for second. It hailed de Palma as a popular favorite and was greatly cast down by the untimely demise of de Palma's chances of winning.

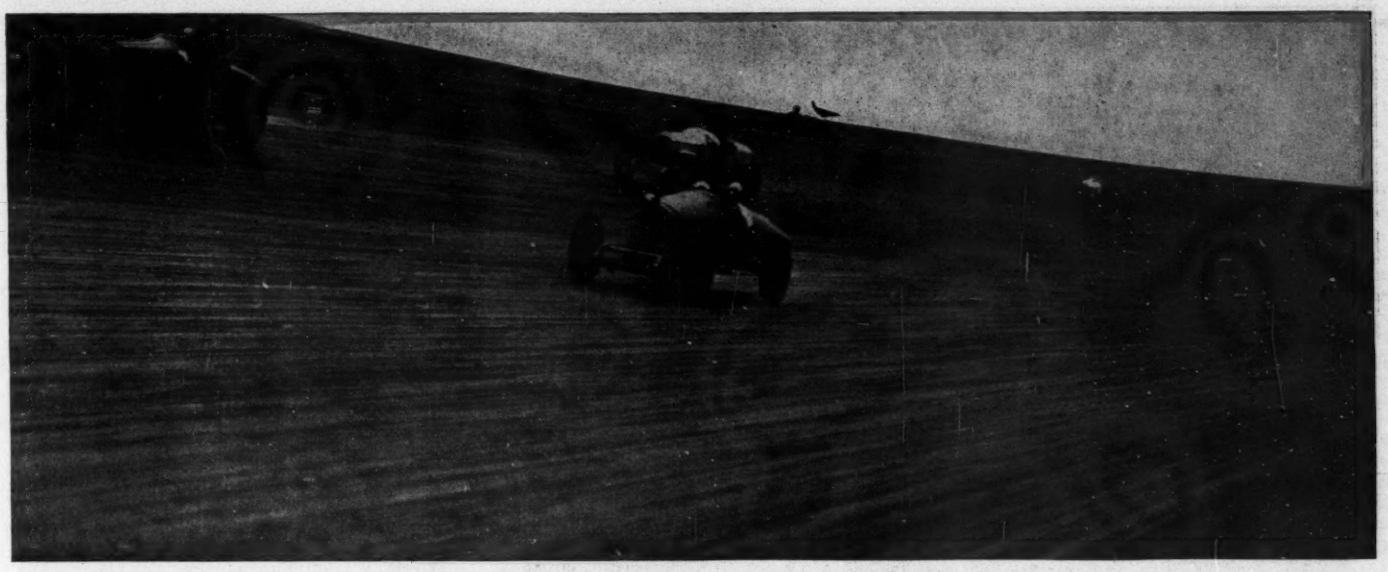
Another of the speedway races has gone down on the record as being one without serious injury to the contestants or spectators. There were two accidents, it is true, among the twenty-eight starters, but no one was hurt. Mel Stringer's M-E-L turned over and ploughed up the field when a rear wheel locked from some cause not yet ascertained. Ostewig's special caught fire on the back stretch and burned up, causing a great flutter among the bleacherites, particularly when 7 min. after it caught fire, the gasoline tank exploded in a volcano of flame. The driver and his mechanic escaped by jumping. Andy Burt, driving the Erbs special, distinguished

Chevrolet, the Winner

Louis Chevrolet, who won the Cincinnati race, is a veteran in motor racing. He is of Swiss-French birth and has been in America for fifteen years. His first mount was a Fiat in which he broke dirt-track records and challenged Oldfield when Barney was in his prime. In 1909 Chevrolet was picked by Pickens to put the Buick cars on the map in racing and Buick cleaned up the season that year, winning the Cobe trophy, Chicago's Classic at Crown Point at that time. His last victory was the Universal trophy event at Uniontown, Pa., last year. Chevrolet builds his own racing cars, the aluminum-engined Frontenac.



Gaston Chevrolet, who finished third with the Frontenac, a duplicate of the mount of his brother, Louis



A brush on the turn at Memorial Day race. Louis Chevrolet leading de Palma—4—with Vail—24—trailing

himself by slowing up to throw a fire extinguisher to the fire fighters.

Louis Chevrolet ran the most consistent race for the entire 250 miles, never making a stop and the $10,000 prize of the $25,000 purse divided among the ten first finishers, was well earned.

The Chevrolet brothers showed great team work, Gaston keeping very close to Louis all the way. Ira Vail came up a long way from the rear to win second position and piloted his Hudson like a general.

The Race in Detail

The grandstands were entertained between events by aviation exhibitions, three airplanes performing thrilling stunts over the track and in the field. They gave an illustration of how inhabitants of European towns are bombarded by hostile airmen. This was provided by D. R. Adams, Kuhl and Ruth Law. They provided patriotic demonstrations by dropping bombs, which in exploding, released red, white and blue parachutes supporting American flags.

When the twenty-eight starters completed the first lap after their preliminary starting lap, they were running in the following order: First, Joe Thomas, in a Mercer special; second, Eddie Hearne, Dusenberg; third, Ralph de Palma, Packard. By the end of this lap, de Palma had jumped to the lead, followed by Oldfield. In the next lap, de Palma was still leading, but Louis Fontaine in a Mercedes had passed de Palma.

Lewis, in the Hoskins, was the first to stop at the pits, coming in on the tenth mile. In another four miles, Fontaine came in for the first of his many tires, and from then on did not figure.

At the end of the first 10 miles, de Palma was leading at a speed of 98.36 m.p.h. Lecaine was forced to dock his Delage with a broken valve before 10 miles had been covered.

At the twentieth mile de Palma was leading the procession with Louis Chevrolet a close second and Haines, in a Mercer special, third. At 30 miles, de Palma was averaging 99.97 m.p.h. Chevrolet took the lead at 40 miles with de Palma second, the speed having dropped to 99.96. At fifty miles the order was the same with Chevrolet doing better than 100 m.p.h.

Oldfield was pushing de Palma very close for second and passed him shortly after. At the 70-mile post, the two Chevrolet brothers were leading the field at 100.79 m.p.h. De Palma again assumed the lead at the 120th mile with Louis Chevrolet a close second. The time was better than 101 m.p.h. De Palma held this lead until 150 miles had been covered, when he retired. This left the two Chevrolet brothers as the head-liners up to the 230th mile.

During this time there had been a number of retirements from the race, one of them being the second Delage driven by DeVigne, who retired with a cracked cylinder.

At about 220 miles, Gaston Chevrolet took the lead, to be shortly passed by Vail in front of the grandstand. By the end of 230 miles, however, Gaston had taken the lead away from Vail and Louis Chevrolet had also passed the Hudson, so that the two brothers were making a team of it for first and second, though in reverse order. Gaston, however, slowed up to the pits and his brother showed the way for the rest of the distance.

Jerry Rothart who won the Free-for-All in a Hudson Super-Six

Gaston Chevrolet was almost put out of the race at the 140th mile when a tread wore off the back tire and wrapped around the brake sheet. The car whirled around and banged into the wall on a turn and the exhaust pipe was loosened. Gaston slowed down at the pit thinking that he would have to change tires, but as the race was nearly over, he was signalled to keep going.

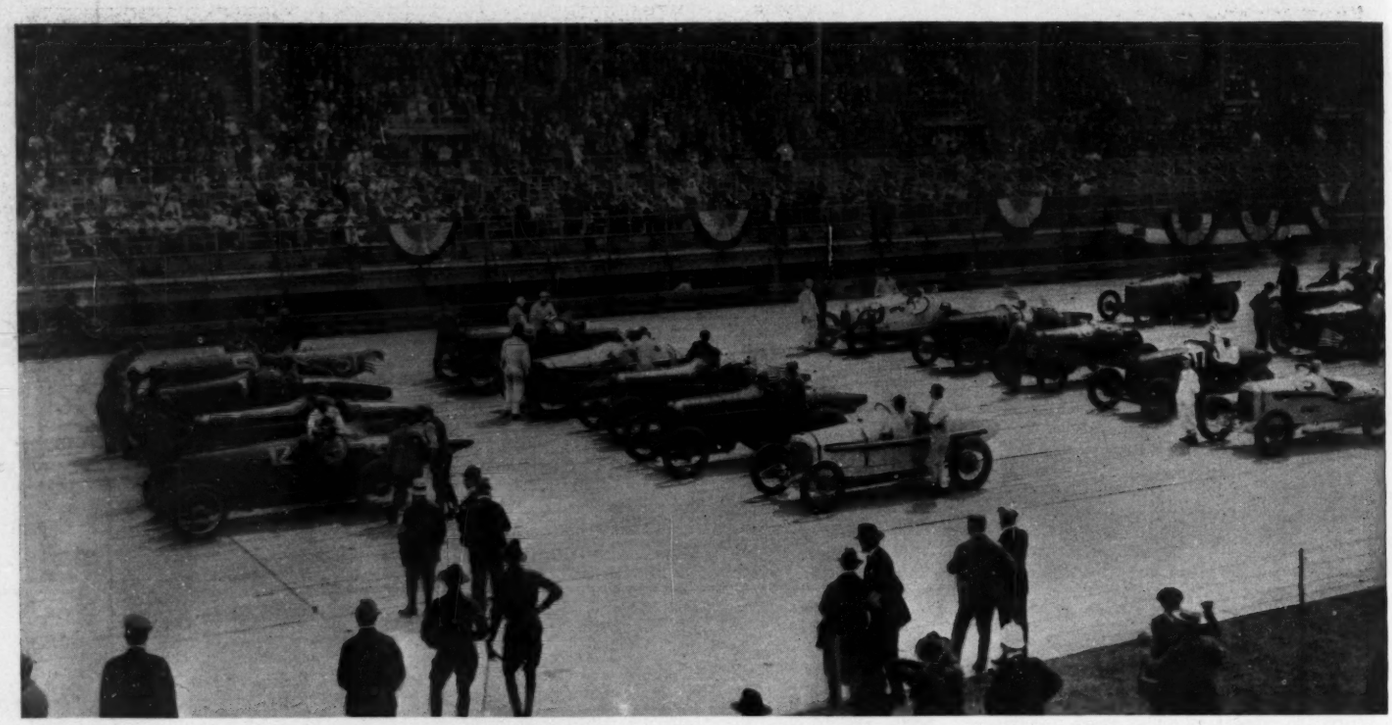
Vail slowed up at the pit at the same time Gaston Chevrolet came in, but lost little time and passed Gaston for second in the last 10 miles. The finish at 250 miles was very close, only a minute and ten seconds separating first and second, and less than a minute between second and third.

Oldfield, the dean of the speed merchants, was up among the first ten most of the time, but did not finish in the money, checking eleventh at the checkered flag.

There were three of the Chevrolet boys at the track. Louis, who was the winner, is the oldest. Arthur Chevrolet is married and no longer drives. Gaston, the youngest of the brothers, is under thirty years of age. The third Frontenac was driven by Kirkpatrick, who took the place of Joe Boyer, Jr., the young Detroit millionaire who is backing the Chevrolet. Boyer was hurt in a motor car accident at Detroit last week.

Rickenbacher Called to War

War has placed its iron hand on racing, with one result that Eddy Rickenbacher, who was scheduled to drive the Detroit Special, was forced to give up the wheel to Buzane. Rickenbacher was called to Washington on important government busi-



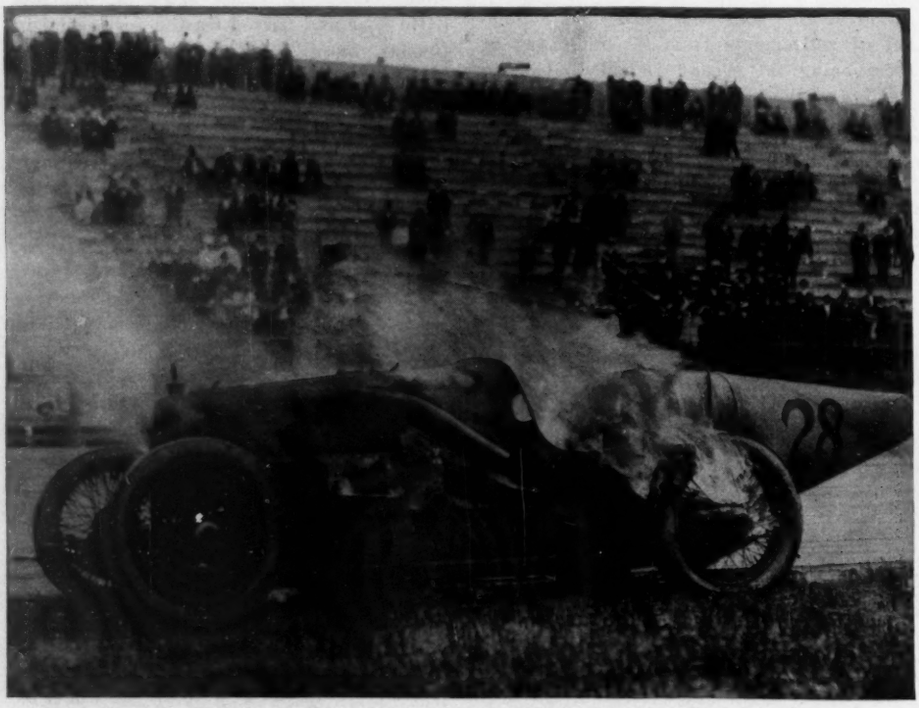
Lineup of cars for the start of the 250-mile race at Cincinnati Speedway

POSITIONS OF FIRST FOUR FINISHERS AT EACH 50 MILES

No.	25 Laps 50 Miles	50 Laps 100 Miles	75 Laps 150 Miles	100 Laps 200 Miles	125 Laps 250 Miles	M.P.H.
1	29 :52	59 :27	1 :29 :12	1 :57 :12	2 :25 :47 :90	102.18
14	31 :01	1 :00 :40	1 :30 :20	1 :59 :02	2 :27 :57 :44	101.38
24	29 :52	59 :29	1 :29 :13	1 :57 :13	2 :28 :45 :73	100.08
7	31 :06	1 :01 :54	1 :33 :11	2 :02 :26	2 :32 :47 :55	98.10

ness. The timing and scoring, and the entire management of the race was average for events of this kind.

There were a number of changes in the standing of the finishers, the places for prize money being altered quite considerably from the original announcement after the timers and scorers had an opportunity to recheck the timing table. First announcements placed the two Chevrolet brothers first and second with Vail third, but a recheck of the table showed Gaston Chevrolet as third with Vail as second. There was also some rearrangement among the standings of the finishers, with all finishers apparently satisfied.



The Ostewig Special in flames; the car burned for seven minutes before the gasoline tank exploded

The Race from the Pits

THE most prominent feature of the record of the technical work done at the pits is the fact that no marked mechanical weakness was disclosed by any of the cars. In previous races the cars have failed from broken connecting-rods, burned-out bearings, and faults of a similar nature to a marked extent, while in this race only one car went out on account of a broken rod, and only one with a burned-out bearing.

The matter of tire changes is always one of important interest. These also were few considering the twenty-seven starters. There were ten tire changes in all, and of these, four were made by one car, the Mercedes, driven by Louis Fontaine. The only other car to have more than one tire change was the Stutz, driven by Earl Cooper, which made two changes. Four other cars changed tires once. These were the Hoskins, driven by Dave Lewis, the Newman Special, driven by W. E. Taylor, the Johnson Special, driven by Wilbur Monahan, and the Duesenberg Special, driven by Eddie Hearne.

de Palma's Ill Luck

The greatest misfortune of the entire race was the peculiar accident which happened to Ralph DePalma. His Packard twelve-cylinder engine was running perfectly and he was in the lead, with an excellent chance of winning, when a splinter from the board track was driven against his radiator with sufficient impact to penetrate it and cause a leak which could not be remedied. He was thus forced to withdraw.

Engine Sizes and Equipment of Cincinnati Racers

CAR	DRIVER	BORE	STROKE	DISPL.	IGNITION	CARBURETER	OIL	PLUGS	TIRES	WHEELS	SHOCK ABS.	MOTOMETER
Crawford Spec.		3.75	6.75	298.2	Bosch	Miller	Mobiloil B	Rajah	Goodyear	Rudge	Hartford	Boyce
Crawford Spec.	C. M. Ewan	3.75	6.75	298.2	Bosch	Miller	Mobiloil B	Rajah	Goodyear	Rudge	Hartford	Boyce
Oldfield Delage	Barney Oldfield	3.635	7.00	299.0	Bosch-Berling	Miller	Oilzum	A C	Firestone	Rudge	Hartford	Boyce
Frontenac	Louis Chevrolet	3.87	6.37	298.0	Bosch	Miller	Caster	K. L. G.	Goodyear	Rudge	Hartford	Boyce
Frontenac	Gaston Chevrolet	3.87	6.37	298.0	Bosch	Miller	Caster	Champion	Goodyear	Rudge	Hartford	Boyce
Stutz Spec.	Earl Cooper	3.828	6.50	295.0	Bosch	Miller	Aristo	Rajah	Goodyear	Rudge	Hartford	Boyce
Ostewig Spec.	S. Ostewig	4.339	5.00	293.0	Bosch	Miller	Caster	Rajah	Silvertown	Houk	Hartford	Boyce
Delage	Jack LeCain	3.769	6.00	280.0	Bosch	Miller	Caster	Rajah	Goodyear	Rudge	Hartford	Boyce
Delage	Jules DeVigne	3.780	6.00	280.0	Bosch	Miller	Caster	Rajah	Goodyear	Rudge	Hartford	Boyce
Omar Spec.	Omar Toft	3.750	6.750	298.2	Bosch	Miller	Oilzum	Rajah	Goodyear	Rudge	Hartford	Boyce
Duesenberg Spec.	Eddie Hearne	3.750	6.750	298.2	Bosch	Miller	Oilzum	Rajah	Goodyear	Rudge	Hartford	Boyce
Packard	Ralph de Palma	2.625	5.00	299.0	Delco	Zenith	Monogram	K. L. G.	Goodyear	Rudge	Hartford	Boyce
Detroit Spec.	Buzane	3.824	6.50	283.0	Bosch	Miller	Monogram	Grossman Spec.	Goodyear	Rudge	Mondex	Boyce
Mercedes	Louis Fontaine	3.70	6.50	278.0	Bosch	Mercedes	Monogram	Grossman Spec.	Goodyear	Rudge	Mondex	Boyce
Hudson Super-6	Ralph Mulford	3.503	5.00	288.6	Delco	Hudson	Oilzum	A. C.	Goodyear	Rudge	Hartford	Boyce
Hudson Super-6	Ira Vail	3.522	5.00	290.0	Delco	Hudson	Oilzum	A. C.	Goodyear	Rudge	Hartford	Boyce
Hudson Super-6	A. H. Patterson	3.502	5.00	288.6	Delco	Hudson	Oilzum	A. C.	Goodyear	Rudge	Hartford	Boyce
Mercer Spec.	W. S. Haines	3.872	6.375	300.7	Bosch	Miller	Oilzum	Rajah	Goodyear	Rudge	Hartford	Boyce
Mercer Spec.	Jos. Thomas	3.872	6.375	300.7	Bosch	Miller	Oilzum	Rajah	Goodyear	Rudge	Hartford	Boyce
Mercer Spec.	Pete Henderson	3.872	6.375	300.7	Bosch	Miller	Oilzum	Rajah	Goodyear	Rudge	Hartford	Boyce
Newman Spec.	W. E. Taylor	3.812	6.50	295.0	Bosch	Miller	Oilzum	K. L. G.	Goodyear	Rudge	Hartford	Boyce
M. E. L. Spec.	Mel Stringer	3.977	6.00	296.0	Bosch	Miller	Oilzum	Rajah	Goodyear	Rudge	Hartford	Boyce
Erbes Spec.	Andy Burt	3.638	7.125	295.0	Bosch	Miller	Oilzum	K. L. G.	Silvertown	Rudge	Erbes	Boyce
Duesenberg	Tom Milton	3.75	6.75	298.2	Bosch	Miller	Oilzum	Rajah	Goodyear	Rudge	Hartford	Boyce
Hoskins Spec.	Dave Lewis	3.75	6.75	298.2	Bosch	Miller	Oilzum	Rajah	Goodyear	Rudge	Hartford	Boyce
Johnson Spec.	W. Monahan	3.750	6.75	298.2	Bosch	Miller	Mobiloil B	Rajah	Silvertown	Rudge	Hartford	Boyce
Ogren	Henning	3.656	7.00	292.0	Bosch	Miller	Oilzum	Rajah	Goodyear	Houk	Hartford	Boyce

The following drivers used Dixon's graphite lubrication: Louis and Gaston Chevrolet, Milton, Hearne, Cooper, Henning, Toft, and Oldfield.

Another misfortune which narrowly escaped proving fatal was that which befell Mel. Stringer in the M. E. L. Special, which broke a steering knuckle on the back stretch and turned over.

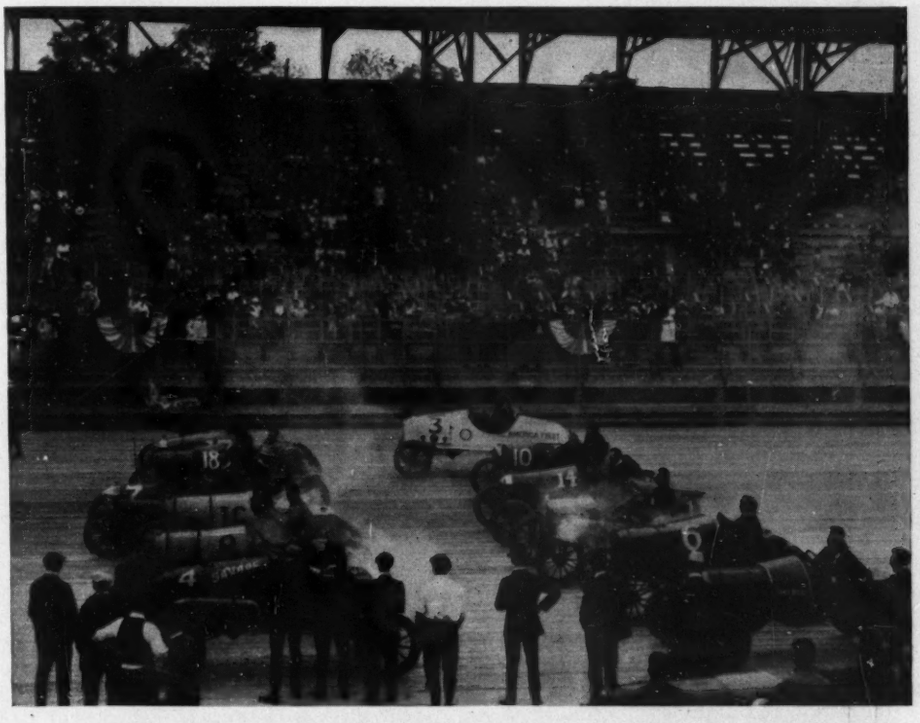
Another of the troubles which generally disturbed the racing drivers but which were infrequent on this occasion, was the matter of shorted spark plugs. Only two changes of plugs are recorded. These were made by Earl Cooper in the Stutz Special, and Chevrolet in one of the Frontenacs. That spark plug trouble has largely been eliminated is due to the fact that better locations have been found for the plugs, and by the fact that the oiling regulation has been greatly improved. In fact, the only oil trouble that was noticed was due to constructive failures rather than to any misfunctioning of the oiling system. Haines' Mercer had trouble with a broken oil line, and this put him out of the race, while Monahan's Johnson Special had a leaky oil pan which caused him to come in for a fresh supply of lubricant six times during the race.

Gasoline Consumption

As regards gasoline consumption, some of the cars averaged quite close to 10 miles per gallon. The Hudsons, which have a 29.5 gal. main supply tank, held the whole distance of 250 miles on this supply.

The pit work was quite good in spite of the fact that many of the pit hands were new. Some of the tire changes were made in 20 sec., and none of them took over 40 sec. The changes of plugs were also made in very quick time. Practically every stop at the pits, however, was of a very minor nature and only in the cases where cars were put out of the race altogether were the causes serious enough to require any great amount of mechanical work.

Summing up the situation, it may be said that the cars ran much more steadily and at a more even pace than is usual in races of this length. It was evident from the running of the race that it was believed that a speed of 100 m.p.h. would win, and a number of the pit managers set out to take the race on this basis. The fact that the leaders forced a higher pace than this gave rise to the unusual occurence that the average speed of the race increased as time went on instead of dropping off as is usual. It was gradually learned that it took more than 100 m.p.h. average to win the race, but even this hot pace did not cause any great increase in the number of pit stops, and the accompanying table will show the trivial nature of most of the stops:



The battle of the pygmies—Start of the Ford Invitation race, 20 miles, won at over 63 miles per hour

Tabulation of Stops

CAR	DRIVER	STOPS
Mercedes	Louis Fontaine.	Tire
		Tire
		Tire
		Tire
		Broken connecting-rod—out
Detroit Spec.		Carbureter
		Valve spring retainer
		Radiator cap
		Broken clutch—out
Packard	Ralph DePalma	Punctured radiator—out
Stutz Spec.	Earl Cooper	Tire
		Tire
		Spark plugs
Mercer Spec.	Pete Henderson	Burned-out bearings—out
Frontenac	Jos. Boyer, Jr.	Broken gasoline line
		Water in magneto
		Spark plugs
		Out—broken valve
Hoskins	Dave Lewis	Tires and gasoline
		Carbureter
Delage	Jules DeVigne.	Oil, gasoline and water
		Cracked cylinder—out
Newman Spec.	W. E. Taylor	Tire
Mercer Spec.	W. S. Haines	Broken oil line—out
Delage	Jack LeCain	Broken valve plunger—out
Crawford Spec.		Sticking float
Ostewig Spec.	S. Ostewig	Burned up—out
Omar Spec.	Omar Toft	Broken gasoline line
M. E. L. Spec.	Mel. Stringer	Broken steering knuckle—out
Johnson Spec.	Wilbur Monahan	Oil
		Oil
		Oil
		Oil
		Oil and tire
		Oil
Duesenberg Spec.	Eddie Hearne	Tire

In the free-for-all race, which was closely contested by Hudson and Paige and finally won by the Hudson, the winner was equipped with the standard Delco ignition, two Hudson carbureters, A. C. spark plugs, Oilzum oil, Goodyear tires, and Rudge-Whitworth wheels. It had a special camshaft design to give an increase lift of .024 in. to the valves.

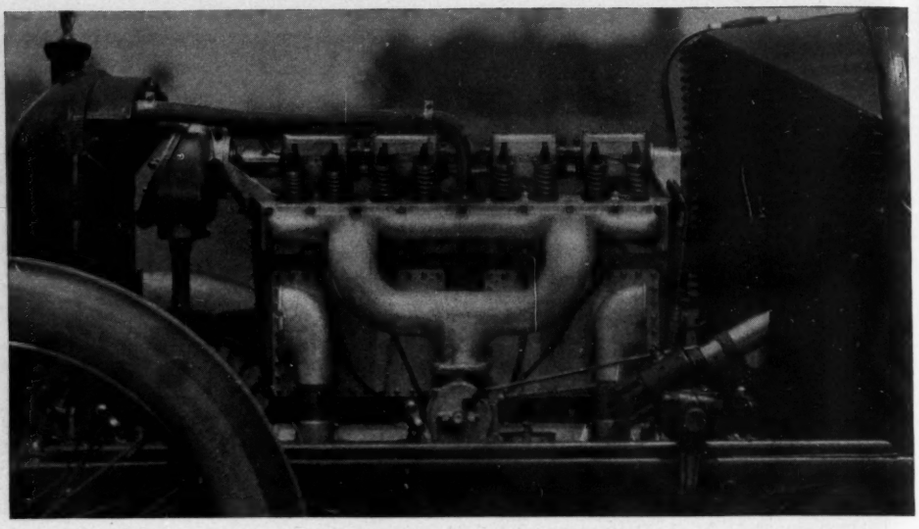
The Paige, which came in second, was equipped with a Dixie magneto, Rajah spark plugs, Goodyear tires, and also had the standard block bored out for larger valves, with a new camshaft.

In the Ford race, the four leading cars were fitted with the Peugeot type head, manufactured by R. M. Roof, Anderson, Ind. The winning Ford had a Splitdorf magneto with Splitdorf plugs, Master carbureter, and 2¾ to 1 rear axle. It also had A. C. brakes.

The second Ford also had a Splitdorf magneto with A. C. brakes.

ORGANIZES TRACK RACING

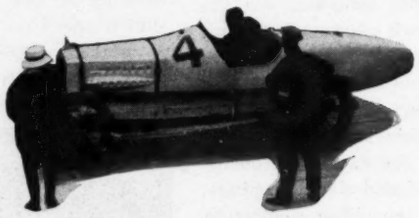
Milwaukee, Wis., June 1—The Wisconsin Motor Contest Board is the name selected for the new association of Wisconsin dealers and others interested in dirt track racing, which will conduct its first meet on the mile track at State Fair park in Milwaukee, July 4. Leslie D. Frint, Monroe distributer, has been elected president, and Bart J. Ruddle, secretary and manager. Mr. Ruddle is assistant secretary and manager of the Milwaukee Automobile Dealers, Inc. It is stated that the purpose of the contest board is to protect the interests of the owners of racing cars, drivers and fair associations controlling dirt tracks, as well as the promoters of races.



The aluminum engine of the victorious Frontenac with its overhead camshaft

The Winning Frontenac

The Frontenac cars are examples of the extensive use of aluminum. The motor is almost wholly aluminum alloy, the particular alloy being Lynite, which weighs approximately one-third as much as cast iron. This includes cylinder block, clutch, housing, engine base, etc. The whole power plant, including engine, flywheel, clutch, exhaust and starting crank, weighs only 490 pounds, while the entire car tips the beam at a trifle less than 1600 pounds, or about 300 pounds less than the weight of any other car in the race. The Frontenac was built by Chevrolet on the idea that most racing cars were much heavier than they needed to be and he believed that he could combine lightness and speed. This is the same car that Chevrolet used at Uniontown when he won the universal trophy, and it seems he has succeeded in the low-weight speed combination. Details of the car, together with those of the others in the race, are given on other pages of the race story.



Stopped by a splinter

PARKS WILL REMAIN OPEN

Washington, D. C., June 1—Reports to the contrary, the national parks will not be closed to visitors during the 1917 season, according to Secretary of the Interior Franklin K. Lane. The secretary believes that the entrance of the United States into the war will not affect materially western tourist travel. The department has been working to put the parks on a par with the best-equipped summer resorts, and this year the hotel system of Yellowstone Park will be supplemented by new permanent camps and the ten-passenger touring cars.

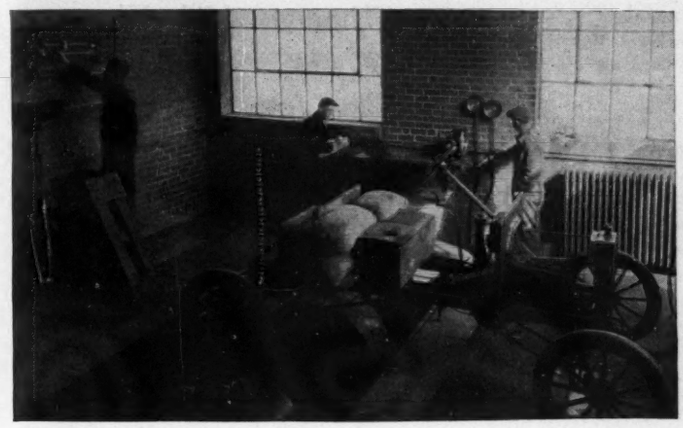
In the Yosemite a new hotel at Glacier Point will be opened, and in Paradise valley in Mount Ranier Park, the new Paradise Inn will entertain its first visitors. New transportation facilities have been provided for these parks also. Rocky Mountain Park also has new hotels, while road improvements are being made extensively. The Department is giving special attention to the stimulation of motoring by issuing free guide maps, showing the road systems of the larger parks and the state highways connecting them. New circulars of information will be ready for distribution soon.

EMPLOYES GIVEN INCREASE

York, Pa., June 1—Three hundred and fifty employes, including foremen of the various departments, have been granted a 10 per cent increase in wages by the Pullman Motor Car Co.

Teaching Uncle Sam's Drivers

Iowa State College Has Summer Course to Fit Men to Operate Cars and Trucks



Traction dynamometer used in the classroom at Ames college

OUR army needs thousands of men who can operate motor cars, ambulances and trucks. These men should understand the principles which underlie the operation of the various parts so well that they will be able not merely "to run a machine" but "to keep one running." Possibly nine-tenths of the men who have owned and operated cars for several years, and unfortunately entirely too large a percentage of the garage men do not know how, quickly and intelligently, to identify or locate the cause of failure of an engine to start or to operate properly. They hunt here and there, but have no definite system of procedure. Such men as these need to acquire definite knowledge of principles of operation and methods of locating trouble and of making important adjustments in order that they can be depended upon to keep a car running under such conditions as will be met with in military service.

The Iowa State College at Ames, Iowa, is preparing to give several courses dealing with motor car care, repair and operation in connection with its summer military encampment. Some of the students will spend the entire six weeks acquiring a thorough knowledge of the principles and much practice in repair and operation of motor cars and tractors. Nearly all men who are attending summer camp to take the instruction offered in military telephony, military telegraph, and military radiotelegraphy will take special motor car instruction.

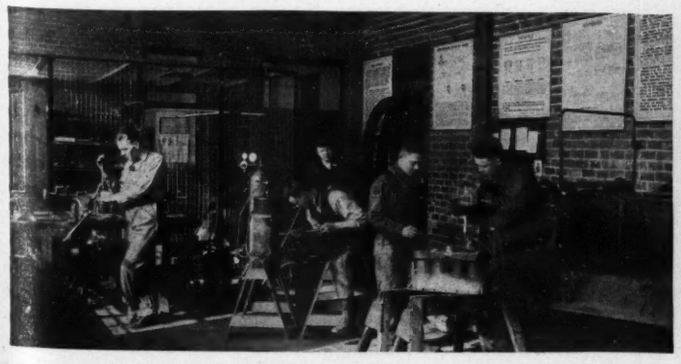
For three years the Ames college has been conducting courses of instruction in motor car care, repair and operation for the benefit of students enrolled in various courses such as agriculture, animal husbandry, horticulture, veterinary science, industrial science, forestry, farm crops, as well as students in mechanical, electrical, civil, and other engineering courses. As a result competent instructors and the necessary equipment are now available. The work given will be somewhat similar to that offered by the better class of motor trade schools. The work will consist of lectures and laboratory work, covering principles of operation, repair work and adjustment, driving etc.

The students will live in camp under military discipline and will receive military training for one hour daily.

The total cost is: Fee, $5; rental of tent, 25 cents to $1 a week; rental of cot and mattress, 30 to 50 cents a week; board, $4 to $6 a week, and uniform $5 and $5.50. The course requires six weeks.

The Iowa State College organized a unit of thirty-six men selected from several hundred student applicants and has just finished training them for ambulance service in France. These men had all had several years of experience as drivers of cars. They spent every afternoon for two weeks tearing down and building up and adjusting and driving cars of the types now in use in ambulance service. They have been taught how to locate and remedy any troubles which are likely to occur on the road and almost any one of them would be competent to exchange positions with one of the three repairmen who form part of the unit. They have been enlisted and expect to leave the country with the first ambulance units some time soon.

How the students at Ames are housed



A corner of the school where instruction is given on engines

This shows instruction being given on axles

31 Entries for June 16

Pilots Begin Warming Up Mounts at Chicago Speedway for Third Meet

25 Per Cent of Gross Receipts to Be Given for War

CHICAGO, June 5—Twelve of the thirty-one cars entered for the annual racing derby on the Chicago speedway are now at the track and the others are either in the local freight yards or due to arrive to-day or to-morrow. At a meeting last night officials of the race were designated and final arrangements for the 250-mile dash made. C. H. Foster, president of the Speedway Country Club, will referee the main event. Fred J. Wagner will occupy his usual position as starter with Thomas J. Hay as assistant. Harry Nipper will handle the timing.

Tommy Milton, one of the three Duesenberg pilots, qualifies as the early bird, having been the first to try out his mount this year on the local board oval. The entries to date follow:

Driver	Car
Hudson	Mulford
Hudson	Patterson
Hudson	Vail
Hudson	Gable
Newman-Stutz	Taylor
Omar Special	Toft
Stutz	Cooper
Mercer	Haines
Mercer	Thomas
Mercer	Unnamed
Frontenac	L. Chevrolet
Frontenac	G. Chevrolet
Frontenac	Boyer
Crawford	Ewan
Crawford	Britt
Olsen Special	McBride
Olsen Special	Unnamed
Ogren	Mason
Ogren	Henning
Unnamed	Oldfield
Hoskins	Lewis
Pan-American	Alley
Duesenberg	Milton
Duesenberg	Hearne
Duesenberg	Detrich
Packard	de Palma
Ostewig Special	Ostewig
Mercedes	Fontaine
Detroit Special	Buzane
Delage	Lecain
Delage	Devigne

Another entry is practically certain, that of Andy Burt in an Erbs Special, which will bring the list up to thirty-two, the limit under A. A. A. rule for 2-mile tracks. Eliminations will be run off Thursday, June 14.

Seven entries have been received for the amateurs' race that will be the curtain-raiser. These include four Mercers, one Locombile, one Haynes and one Peerless. This will be a 100-mile event, and Charles Stiger will referee.

Oldfield's new car has been shipped from the Pacific coast, and if it takes to the course as Barney feels it should he will pilot it June 16, turning his Delage over to Cliff Durant.

There will be some university track events prior to the motor races. There has been some question as to the exact amount or percentage of the gate that is to be given for war use. At first it was intended to give a percentage of the net, but it has finally been agreed that 25 per cent of the gross receipts will be given toward defeating Mars grind against the world.

BARBER WINS AT WASHINGTON

Washington, D. C., June 1—Irving C. Barber and his car, the Beaver Bullet, carried off the lion's share of the prize money at the race's Decoration Day, finishing first in the four events for which his car was eligible. The races were under the sanction of the A.A.A. and consisted of five events, the 5-mile for non-stock cars of 300 cu. in. and under, won by the Kline car driven by M. Kriner; the 5-mile non-stock for cars of 301 to 450 cu. in.; the 10-mile non-stock, free for all, won by Barber; the 5-mile non-stock handicap, free for all, won by Barber, and the 20-mile non-stock, free for all, won by Barber.

CHEVROLET SETS RECORD

Eugene, Ore., June 2—Bill Wallace of Portland, accompanied by C. M. Steves of Oakland, Cal., defeated the Shasta Limited in a race from Portland to Eugene recently, in which Wallace was driving a stock Chevrolet four-ninety. The train's time was 3 hr., 51 min., while the car made the 132 miles in 3 hr., 49 min. The previous car record was 4 hr., 20 min., 10 sec.

FORD PLANS APPROVED

Detroit, June 4—William Livingstone, president of the Dime Savings Bank and for many years president of the Lake Carriers' Association, testified to-day in the trial of the Dodge-Ford suit and told how he had for the last two years assisted Henry Ford in perfecting plans for the improvement of the River Rouge where the Ford blast and tractor plant are to be built. He stated that the government's engineers, the secretary of war and the congressional committees favored the plan. This plan of shipping directly from the Ford company's own docks on the Rouge had been cited by the Dodge brothers as evidence of the impractical character of Henry Ford's ideas.

Mr. Livingstone said, "I consider that the site chosen for the Ford smelter was very wisely chosen and that the proposed development of the Rouge is feasible, practicable and economical."

Chicago Is Motor Depot

Army to Buy Cars and Trucks Through Mid West Headquarters

Makers Are Asked to Submit Bids and State Delivery

CHICAGO, June 4—All motor vehicle equipment for the Army is to be purchased through the Chicago depot of the Quartermaster's Corps. Colonel A. D. Kniskern at the headquarters of the central department in Chicago is in charge of this work, and the first bids, as mentioned in MOTOR AGE two weeks ago, are to be opened June 8, others June 10 and still others June 11, Sunday. Manufacturers of motor trucks have been requested to submit bids on trucks according to the Army specifications, but it is understood from sources close to Quartermaster's headquarters that truck manufacturers should bid on their own specifications where they cannot comply with the standard government specifications.

Truck manufacturers should specify make of their units, such as motors, gearset, axle, etc., and most important, should state definitely just how many vehicles they are in a position to deliver per year and per day and the quantity and date of earliest possible deliveries, without jeopardizing the commercial trade.

Classification of bids will take some time, and the date of the ultimate awards is yet to be decided upon.

LARGER WOODS AT $2,950

New York, June 5—Special telegram—The woods Motor Vehicle Co. is making deliveries of an enlarged model of its dual-power car. Only one model, a four-passenger coupe, selling at $2,950, will be made. The essential changes are the use of a 2¾ by 4 cylinder Continental engine and the lengthening of the wheelbase to 124 in. The tires have been enlarged to 35 by 4½. The electrical elements are identical with those of the previous model.

TWIN CITIES RUSH TRUCKS

Minneapolis, Minn., June 2—War is accelerating the truck business in the Twin Cities. The E. G. Staude Truck Mfg. Co. has just completed a rush order amounting to $85,000, sent by express to be delivered in London. All 120 employees turned in and in 29 hours' continuous work had packed 500 Mak-A-Tractors, on which the express charges to the Atlantic seaboard were more than $9,000. A steamship was held at port for the order.

Since Jan. 1 more than $3,000,000 worth of tractors have been sent out for the Allied forces, or 1000 machines. Emerson-Brantingham Co. shipped 300 to France, Russia and England and has contracts for

as many more. Gray Tractor Co. has shipped 150 tractors, and orders still are unfilled. The Bull Tractor Co. has sent out 250 machines and is making continuous shipments to England.

Six G-M-C motor ambulances have been sold by B. E. Fawkes, distributer, to Minneapolis citizens, three for the local base unit hospital and three for the Norton-Harjes corps. Each car has a special body and costs $1,805.

MORRIS BANK ORGANIZED

Detroit, June 4—The Industrial Morris Plan Bank of Detroit has been organized to extend loans to motor car and other workers in this city. Edwin S. George, president of the Steel King Motor Plow Co., is president, and Eugene W. Lewis, vice-president of the Detroit Axle Co., is vice-president. Car makers were instrumental in organizing this bank, the purpose of which is to eliminate the evils of the loan charge as regards motor car workers.

MAKERS BUY LIBERTY BONDS

Detroit, June 1—Detroit manufacturers assembled at the board of commerce last night subscribed to millions of dollars' worth of Liberty Bonds. The Ford Motor Co. was the first and largest subscriber, taking $1,250,000 worth of bonds for its employes. The Cadillac Motor Car Co., the Detroit Copper & Brass Rolling Mills and the Maxwell Motor Co. each subscribed for $250,000 worth. The Continental Motors Corp., Detroit Steel Products Co., Timkin-Detroit Axle Co., Chalmers Motor Co. and the Fisher Body Corp. each subscribed to $100,000. Subscriptions of $50,000 were made by the Hayes Mfg. Co., the Edmunds & Jones Co., the Russell Wheel & Foundry Co., General Aluminum Brass Mfg. Co.

LIBERTY BONDS FOR SALES

Detroit, June 2—The Packard Motor Car Co. has started a Liberty Bond race which will last until June 15. Prizes will be given as follows: For three sales, of new Twin Sixes exclusively, two $50 Liberty bonds; for four sales, three bonds; for five sales, four bonds; for six sales, five bonds; for seven sales, six bonds; and for eight sales, seven bonds.

LIBERTY BONDS FOR PRIZES

Detroit, June 4—The Maxwell Motor Car Co., Inc., will give $50,000 in United States Liberty Bonds to owners and dealers in a 1-gal. gasoline economy test to be held June 16 to 25. The company expects an entry list of 40,000 cars.

MUTUAL ENCOURAGES BOND ISSUE

New York, June 1—Marion-Handley cars may be bought with Liberty Bonds. The Mutual Motors Co. has arranged to cash these bonds at $110 as payment for every $100 paid for the car.

Indict Emerson Officials

Grand Jury Holds Fourteen Men on Charge of Conspiring to Defraud

Stock Jobbing in Promotion Alleged After Receiver Is Appointed

NEW YORK, June 5—One hour after a receiver in bankruptcy had been appointed to-day for the Emerson Motors Co., fourteen men connected with the company and its stock promotion were indicted by the Federal grand jury on a charge of conspiring to use the mails to defraud the public. The charges cover eighty-five typewritten pages and in substance allege that the company sold its stock on representations which it did not intend to carry out. The allegations are similar in substance and tone to those made by the petitioners in bankruptcy whose claims are set forth below.

Those indicted are: Theodore A. Campbell, president; Robert Craig Hupp, former vice-president and general manager; George N. Campbell, treasurer; George B. Gifford, Nicols Field Wilson, Willis George Emerson, Henry B. Humphrey, William A. Morgan, Osborne E. Chaney, Frank Sturkens, William Loomis, Bron R. Riess, William H. Stetson and Robert P. Matches. The companies involved are Emerson Motors Co., manufacturer, C. R. Berry and Co., and Robert P. Matches and Co., brokers, H. B. Humphrey Co., Boston advertising agent.

Bail Was Furnished

Bail was fixed at from $2,500 to $10,000 for the various men and was readily furnished. The receiver in the bankruptcy action states that he has sent two men to the company's plant in Kingston but has as yet secured little information as to the status of the business.

The receiver was named at the request of three stockholders whose names and claims aggregate $9,000. The allegations of the three stockholders are voluminous. They charge that the company incorporated under the laws of Delaware for $10,000,000, $3,000,000 common and $7,000,000 preferred, was originated as a stock-jobbing company for getting the money of an unsuspecting public. It is further claimed that the assets do not exceed $100,000 and that the liabilities are far in excess of $500,000 of the stock, which was so widely advertised, it is charged that $2,700,000 of it, $10 par value, was sold to Nicholas F. Wilson for underwriting, on his promissory note for $470,000 and Emerson, Hupp, Campbell and others.

The Emerson Motors Co. made its first appearance in the middle of 1916. In October, 1916, it was announced that the plant of the Peckham Railway Car Truck Co., in Kingston, N. Y., had been secured and that the production schedule called for 30,000 cars in 1917. The latter part of October, 1916, an investigation of the Emerson plant showed that manufacture seemed really under way. In March of this year the company, according to investigation, was building five cars a day and had shipped quite a few cars. While the project did not measure up to some of the big production ideas regarding the company it nevertheless was proceeding with manufacture.

MAJOR MARMON NOW

Washington, D. C., June 5—Special telegram—Howard Marmon has been appointed a major in the signal corps, U. S. A., in charge of aircraft engines. His appointment as captain was announced last week in MOTOR AGE.

ST. LOUIS THIEVES CAUGHT

St. Louis, Mo., June 1—Last week was a disastrous one for motor car thieves here. Thirty-two machines were recovered from one gang to which more than 100 successful thefts have been traced. Eleven persons were arrested, including Charles Beecher, a Springfield, Ill., garage owner, through whose place the cars were sold. Two women were members of the gang. The plan was for an expert to visit St. Louis and Chicago and point out to employed chauffeurs the cars he would sell and these would be stolen. In the garage used here, equipment for removing engine numbers and many duplicate parts and equipment for the makes of cars usually stolen were found. Late in the week a policeman shot and killed a thief driving a stolen car. A few weeks ago a local garage owner named Ebbeler was arrested. His plan was to take orders from country dealers for certain makes of used cars at a specified price, then arrange for stealing a car of that value.

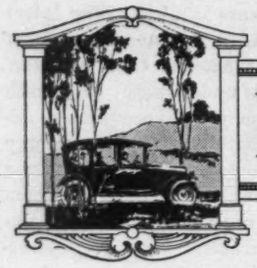
N. A. A. A. J. TO GIVE AMBULANCE

Excelsior Springs, Mo., June 1—Directors of the National Association of Automobile Accessory Jobbers at a three-day meeting ended here today authorized the purchase of $10,000 worth of Liberty bonds and an ambulance, together with an amount sufficient to provide a field man for its operation for one year, the ambulance to bear the name of the organization. An investigation is to be made to ascertain that whatever is purchased will be of practical value and put into immediate use in Europe.

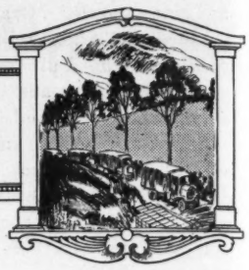
Fourteen jobbers were elected to membership and six manufacturers to associate membership.

Financial reports showed a net balance in the treasury of $34,652.59. The collection department has received 22,483 claims, totaling $120,674, of which 49 per cent have been collected.

The next meeting will be late in August or early in September.



EDITORIAL PERSPECTIVES



No Classes in War

READERS of MOTOR AGE may wonder why so much space in a motoring publication is devoted to purely war subjects. They may wonder that in a periodical devoted solely to the interests of motors, a page is given each week to a subject as seemingly foreign to its particular field as the Liberty Loan or the wastage of guns in the European battle fronts. These things are not foreign to motorists or their interests. In war time every object must be subordinated to that of war. We must fight—each one of us—whether we be called to the front or not. Frank Scott, chairman of the munitions board of the Council of National Defense who is quoted on another page, made the statement that "war has become the most complex of all sciences."

WE are using in the conduct of modern war practically every known science and every form of engineering. We began years ago with the civil engineer, the military engineer, the man who was the architect of the castle, and incidentally introduced into its frame those things that made it strong against attack. To-day we use the civil engineer, the mining engineer, the metallurgical engineer, the automotive engineer, chemistry in all its forms, the science of acoustics, the electrical engineer, every form of surgery, everything known to the physician, everything known to the pharmacist and everything known to the optician, until it seems that there is nothing left in the world that has not been called upon to make its contribution to this business of determining who shall be the victor. From now until the time when we can say honorably that we are at peace we must emphasize the fact that

WE ARE AT WAR

SOMEBODY has said that in peace nothing so becomes a man as modesty and humility, but when the blast of war sounds in our ears, then we must imitate the action of the tiger. Now that we are at war, now that we have at last entered this conflict to do our part in determining what shall rule the world and what kind of ideas men shall bend to from this time forward, it rests upon us to imitate the action of the tiger, and we must put into this effort every ounce of endeavor that this country can put into it until we can say honorably that peace is ours, and that the conditions of peace which are to be imposed shall be our conditions and not those dictated by our enemies.

CHAIRMAN SCOTT on another page gives some conception of the demand for ammunition and guns in modern warfare. You can apply that to production from the raw material up to the finished article. The projectile of the Civil War period was a very simple projectile, made of cast iron and with very few machine operations on it. Many of them had no machine operations at all. Today, if you take the shrapnel forging, it has—just on the forging, before you have loaded it, and without the fuse—fifty-three machine operations; and you are going to fire away twenty to twenty-six of those in a minute. And that is the simplest part of the shrapnel except the brass case. That is the reason for a munitions minister in France, in England, the reason for a munitions board in the United States, and the reason why we may have eventually an even more centralized form of control over our purchasing and manufacturing. For this reason we must realize

WE ARE AT WAR

Make License Number Perpetual

A LICENSE number on a motor car serves several purposes but it is not put to its greatest use and will not be until it becomes perpetual and is made as much a part of the car as is the engine or the rear axle. So much is heard about prevention of car thefts that it is peculiar some action has not been taken to make the license number put fear into the heart of the car thief by making the license plate perpetual and one number serving one car and one car only during the life of a car.

SOME of the advantages of a perpetual number plate are this: It would prevent the changing of license numbers because there would be no necessity for change except when a license plate was lost and then the applicant would have to prove ownership before he could get a duplicate. A new car would be given a number and would carry it indefinitely. If some color identification for the year was thought advisable then a small tag that would carry the year and state abbreviation could be turned over to the car owner each year when he paid his license fee, but he would retain the same number.

ABSENCE of a license tag would be reason enough for an officer to demand that the car operator show his ownership. A person could not obtain a license for any but a new car once the plan was put into effect and all cars numbered. He would have to give rather detailed information on his car to get a license and there should be a department in each county seat to handle the licensing of cars. A car thief would find it impossible to steal a car, secrete it and apply for a new tag, for his only excuse would be that he had lost his tag and the only number he could get for that car would be a duplicate. An owner losing a car would report the loss and his license number. Any attempt to get a duplicate number would mark the thief.

EACH state could effect a material saving in the manufacture or purchase of tags. With the perpetual-number license plate, the year and state part of the tag could be turned out very cheaply, as all of these would be alike instead of each tag requiring a different number when manufactured. The license fee could be the same each year and by making the year and state plate of a different color each year check would be easy on those who had and had not paid their tax.

THIS plan of licensing would make much more simple the mechanics of registration, thereby directing that much more of the license fees to road work. Records would be simpler, and given a car to prove the ownership, as already stated, no tag but a duplicate could retain the car.

Motor Specialists Find Niche in Service

Allies Finally Give Mechanical and Specialized Minds Opportunity to Use Knowledge

AT a time when America is recruiting an army, it is of advantage to note what use France has been able to make of her specialists in the motor car industry. If advantage is taken of this experience it will enable America to avoid some costly errors and to put men into their proper positions at the outset instead of after two or three years of war.

For a long time the French army authorities refused to consider any other value than the military one a man possessed when he went through his preliminary training at the age of 18 or 20. Thus, such men as Michelat, chief engineer of Delage, filled an unimportant post in the fighting forces; Louis Wagner, twice winner of the Vanderbilt, and professional aviator, went into action with the artillery; Jean Chassagne, holder of the fastest race record in the world, sat behind a big gun in a fort on the Swiss frontier, and was not allowed to touch a car.

Recoil Is Gradual

Gradually the defects of this system became evident to the official military mind, and chief engineers were called out of the trenches to control factories which were standing idle for lack of their presence. This recall was only done gradually and grudgingly; when the order was given some of the men had received their last call, some had been taken into Germany; even now some who could be employed to better advantage are in the firing line.

Out of the last European racing team to visit America, one has been killed and another is a prisoner. Georges Boillot fell while fighting German airplanes at 7 to 1 odds. Mechanician Lally, who sat by the side of René Thomas when the Delage won at Indianapolis, is now a prisoner working at the Mercedes factory in Germany. He was captured in the first onslaught, within a couple of months after his return from the States. The Boillot family has had to deplore the loss of another son, a younger brother of Georges, who fell while leading a charge. The third and only remaining son is an aviator at the front.

Arthur Duray, free from military obligations, volunteered for service in the French army. He was turned out of the recruiting offices a dozen times; but Arthur is persistent and was at last taken in and made a motor car driver, which post he still occupies. Mathis, his mechanician at Indianapolis, was given a similar post, first with the French, secondly with the Belgians. Incidentally he had to go through a motor car driving school after transferring to the Belgian army.

Albert Guyot did 18 months' hard service as a motor car driver on the French front. As an old aviator he transferred to the flying corps, was put through the schools as a matter of course and later made an instructor. While engaged in machine gun instruction over water, his machine fell and went under. Guyot managed to work himself free of the underwater wreckage just when he had given up all hope of driving in any more motor races. The fall injured his health, with the result that he has been in the hospital for several months and probably will be discharged shortly as unfit for further military service.

Jules Goux has done all his war work in the motor car service. After being a staff car driver, he was made an officer in the "tanks." Joseph Christiaens fought in Belgium in the early months of the war, was a prisoner, escaped to England, came to America, and is now back in England at the Sunbeam factory. Jean Chassagne, after his experience on the Swiss frontier, was transferred to the Sunbeam factory and is now supervising the fitting of Sunbeam engines to French airplanes in France.

René Thomas, although he had never been a soldier, thought he was fit to drive an army car and volunteered when the fight began. As René has a slight limp, due to a motorcycle accident, and the recruiting officer had never heard of Indianapolis or the first man to fly an Antoinette monoplane, the crack race driver was told to get out. He went and discovered a little later that he could employ his Indianapolis winnings very profitably in helping to develop a little garage into a big factory. The factory is still growing, and Thomas is still controlling it.

Louis Wagner, after experience as an artilleryman and later as a motor car driver, was sent to the airplane factories at the rear. He is now helping to build airplanes for the Darracq company, the firm with which he had his first racing successes. The Italian drivers, Nazzaro and Lancia, are mobilized at their own factories; Cagno, Scales and Fagnano are on army work at the Fiat shops.

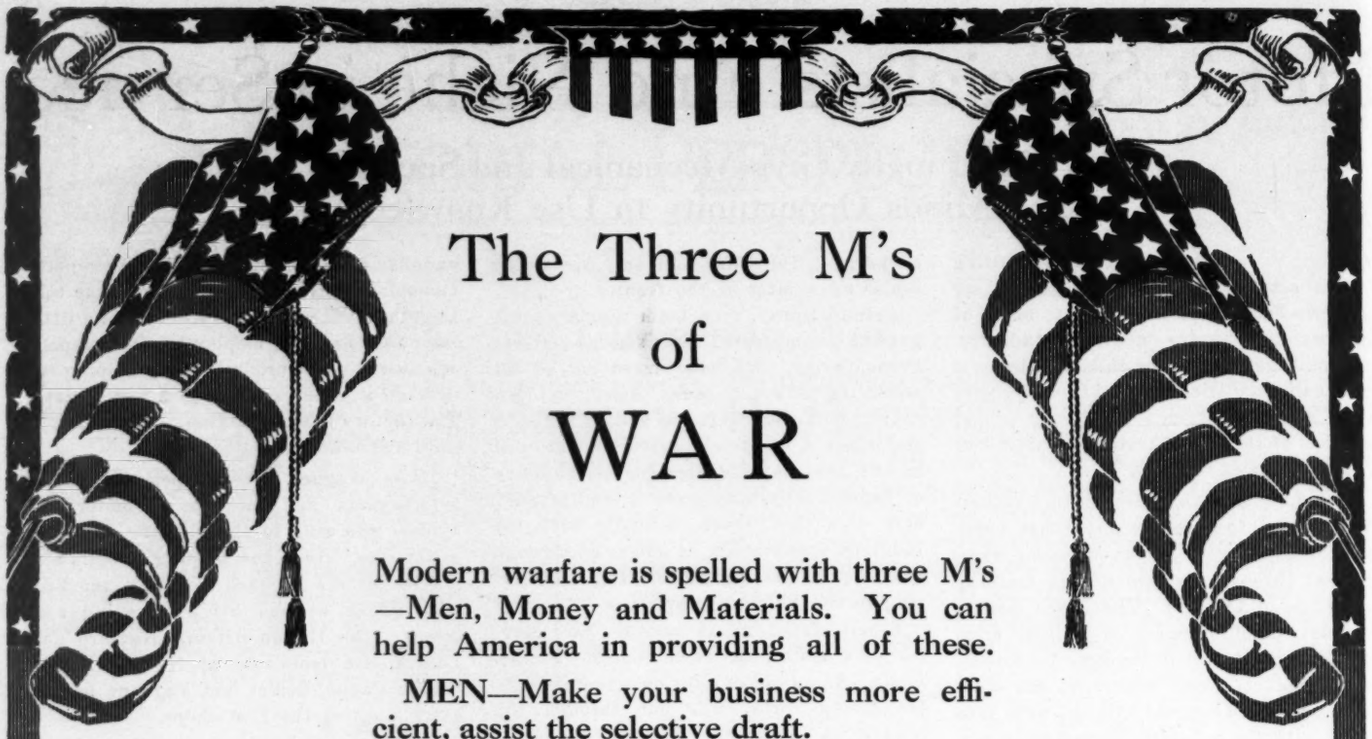
Lesson Is Obvious

Charles Faroux, motor editor and race manager, drove a staff car for a year and now is an engineer at the Government airplane engine test shop. Henry Fournier, old timer who raced in America in the De Dion quadricycle days, is running a munitions factory. The Sizaire Brothers, after being in the army motor service, were returned to their factory to produce airplane engines and other war material.

The lesson is obvious: Every man who has proved a success in the motor car mobile industry should be drafted direct into the motor car or aviation services of the army, quite irrespective of his physical ability to undertake active service with the infantry or other combatant forces. It has taken the Allied armies nearly three years to learn this lesson.

The 100,000 odd motor vehicle drivers in the French army possess a motor car review which is written, edited and made up entirely in the war zone. The publication, which is one of the best yet seen in France, is entitled L'Automobile aux Armees," and has in each issue at least two pages of foreign news, in English and French, taken from The Automobile and MOTOR AGE.

Although built and turned over to the Detroit recruiting station of the Army by the J. C. Wilson Co. to stimulate interest in enlistment work, the large armored "tank" has been very successfully used at Fort Wayne by Lieutenants Crabbs, Spring and Bohstedt in drilling the men of the 33rd Michigan Infantry in modern methods and formations



The Three M's of WAR

Modern warfare is spelled with three M's —Men, Money and Materials. You can help America in providing all of these.

MEN—Make your business more efficient, assist the selective draft.

MONEY—Buy Liberty Bonds.

MATERIALS—Cut out waste.

FRANK SCOTT, chairman of the Munitions Board Council of National Defense, in talking to the Editorial Conference of the Associated Trade Press in Washington, May 25, subdivided "Materials" into "Metal and Machinery" and spelled war with four M's. Illustrating the great wastage of metal, he said:

AT Gettysburg, the greatest battle ever fought on this hemisphere, in three days' fighting, an army of 84,000 men in the federal army used 310 cannon, and the report of their chief of artillery shows that they fired away 32,726 rounds of ammunition in three days. Now, the same number of guns today could fire that ammunition easily in about 7 min. When Sherman marched from Atlanta to the sea, he took with his army of approximately 50,000 men sixty guns and 200 rounds of ammunition per gun, and a French 75- or an English 18-pounder or an American 3-in. gun could fire those 200 rounds very easily in 10 min. They were to last Sherman's guns from October until January.

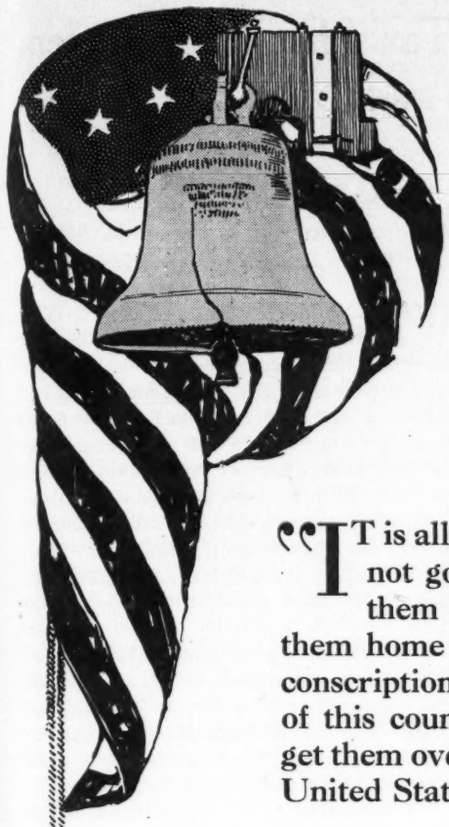
EVERYTHING except food and clothing has been multiplied to about that extent. The definition used to be made of artillery ammunition that it was equivalent of income, something to be spent and replenished, and cannon were the equivalent of capital; you did not expend it. You occasionally lost some of it when you were unfortunate, but you did not expend it. You took it into the service and brought it back.

TODAY, owing to the tremendous increase in gun fire and the fact that the smaller guns, the new guns, can fire say from twenty to twenty-six shots a minute and that powder is of a very different character from the old black powder, the life of the gun is reduced, so that now artillery or cannon themselves have become a part of income to be expended and replenished.

YOUR guns go to the line to do their share of firing; they must be retired and new guns take their place. These guns are relined, and go to the line to take the place of the guns similarly retired to be relined, and so forth, and that process keeps up from the day your troops take the field."

Next Week

America and the Red Cross



HELP Win the War

"IT is all right to ask for volunteers, but if we are not going to be able to feed them and clothe them and equip them, we might as well send them home today. There is no use in passing the conscription bill to get 500,000 young men to go out of this country if you cannot feed them after you get them over to France."—Louis B. Franklin, of the United States Treasury Department.

WE MUST HAVE MONEY FIRST—therefore, subscription to the Liberty loan is the patriotic American's first duty. If we do not raise the money to finance our armies, our navies and our allies, there will be little business left in this country—we are *liable to be defeated* in the world warfare. It is to the salvation of business that this war shall be carried through to a successful conclusion at the earliest possible minute.

EVERY month saved on the duration of the war is *business piled on business for the future*. Every month the war is prolonged means destruction of resources and straining of business. Every cent of the Liberty loan will be spent right here in America. We are lending money to our allies *but* it is not going out of the country—that money is going into our industries. Liberty bonds may be cashed in at any time—the chances are that they will be worth more than they cost.

BUY A BOND

Motorizes Artillery Unit

U. S. to Free Horse From Work of Dragging Medium Caliber Gun

Experiments Indicate Machines Can Handle Most Ordnance

WASHINGTON, D. C., June 1—What is believed to be the first complete unit of horseless artillery in the world has been created through the development of a fully motorized field battery of medium caliber guns by the United States. Both European and American engineers worked on the problem of eliminating the horse entirely from the work of dragging such guns to the front for years before the outbreak of the great war. Successful experiments by the Government now seem to promise an early substitution of the machine for the horse in handling nearly all forms of ordnance.

Experiments were first made with various types of tractors under the direction of the Field Artillery Board at Fort Sill, Okla., and by the Ordnance Department of the Army at the Rock Island arsenal, followed later at Fort Bliss, Tex., with a completely equipped battery. The tractor standards committee of the Society of Automotive Engineers has been actively co-operating in the study of the problem since the outbreak of the war.

The large howitzer types are sure to be motorized, according to Major Lucian B. Moody, who has been in charge of the work. The French 75s and other light types will have to wait for the development of tractors capable of developing a combination of speed for emergencies and pulling power in mud equal to that of horses.

European armies have reduced greatly the number of horses in artillery use. It has not proved possible to eliminate them in hauling certain of the smaller and medium types of ordnance because of the lack of a proper tractor combination of speed and power.

The new creeping, or self-track-laying, type of small or medium size developed by the American Army is built without the steering arrangement in front and while possessing relatively as much power as the type now used in Europe is at the same time capable of turning within its own length by reversing or stopping one of the creeper drivers while the other side continues to move ahead. The experiments with the new types have proceeded far enough to justify plans for the successive motorization of all American artillery units except the smallest calibers required to move at very high speed over bad ground.

DISCUSS MOTORIZING PLAN

Detroit, June 2—Executives from motor factories met yesterday at the Detroit Athletic Club to discuss suitable specifications under which to manufacture supplies for the government and the proposed motorization of the field artillery. Captain William E. Dunn, U. S. field artillery, now on duty in Detroit, told of experiments of the artillery board and predicted that the motorization of the field artillery would produce a saving in money and men. Captain Dunn stated that 5400 trucks would be needed within the next year for the army of 1,500,000 men which the government plans to send abroad. These would release for other service 4040 men and 54,000 horses. Two committees were appointed to investigate the motorization and supply specifications. One committee comprises J. G. Vincent, vice-president in charge of engineering of the Packard Motor Car Co., E. E. Hemp, chief engineer of the Denby Motor Truck Co., and Irving E. Rocamp, technical engineer for the King Motor Car Corp. This committee is in Washington. The local committee includes Leo Anderson, vice-president of the Hupp Motor Car Corp., Charles Denby, export manager for the Hupp Motor Car Corp., D. C. Stanbrough, the Packard Motor Car Co., and Theodore Barthell, the King Motor Car Co.

UNIVERSITY MEN FOR AMBULANCES

Washington, D. C., June 1—The United States Army Ambulance Corps will have 1500 picked men from universities throughout the country for ambulance service abroad. Thirty-two colleges already have contributed men. The corps is to be organized into units of thirty-six men each. They will go into training near Philadelphia and will sail just as soon as possible after their equipment is complete. The Surgeon General has requested the Intercollegiate Intelligence Bureau to assemble the students for this service. As soon as the call was sent out many institutions immediately formed special classes in military tactics, first aid and French. Further training will be given at the mobilization point.

APPOINT PERSHING'S CHAUFFEURS

Washington, D. C., June 1—John J. Jennings, George Limthicum, Elgin Brain and Ray Middleton have been selected by the War Department to go to the front in France as motor drivers with General Pershing. They were recommended by the Society of Automotive Engineers to the Government, who asked that the society recommend drivers of standing and marked ability. All of these have volunteered their services.

PAIGE PROFITS $770,533

Detroit, June 4—The Paige-Detroit Motor Car Co. has had net profits of $770,533 for the year ending Nov. 30, 1916, and a net income of $959,954. Gross sales aggregated $10,588,406. These figures have just been reported by the Paige-Detroit Motor Car Co.

Tax Shifted to Owners

Five Per Cent Levy on Motor Cars at Factory Is Eliminated

Amounts to Vary From $7.50 to $25, According to Prices

WASHINGTON, D. C., June 1—The elimination of the 5 per cent manufacturing tax on motor cars in the war tax bill, as passed by the House, and the levying of a new Federal license on owners, ranging from $7.50 to $25, with reduction for cars used a year or more, were agreed on today by the senate finance committee.

Treasury experts estimate that 1,400,000 owners are subject to the $7.50 tax, 760,000 subject to the $10 levy, 1,219,000 subject to the $15 rate and 231,000 in the $20 class.

The committee's section would provide:

"That on and after July 1, 1917, special taxes shall be and hereby are imposed annually on owners of automobiles and motorcycles, the rate of tax to be based on each automobile or motorcycle as follows:

"Motorcycles, $2.50; automobiles, listed retail price at time of purchase not over $500, $7.50; over $500 and not over $1,000, $10; over $1,000 and not over $2,000, $15; over $2,000 and not over $3,000, $20; $3,000 and over, $25.

"Provided that the special taxes herein imposed shall not apply to manufacturers and dealers as to unsold automobiles and motorcycles held for sale or to owners of automobiles or motorcycles used exclusively for business; provided further that evidence of payment of the tax shall be by receipt or stamp to be attached to automobile or motorcycle, under such rules and regulations as may be prescribed by the commission of internal revenue, with the approval of the Secretary of the Treasury, and provided further that the special tax paid within a fiscal year shall not be imposed again within that fiscal year if ownership changes."

Annual taxes on the different cars are as follows:

$7.50—Ford, Saxon.
10.00—Briscoe 4, Buick 4, Chevrolet 4, Dodge, Maxwell, Oakland 6, Overland 4, Reo 4, Saxon 6, Scripps-Booth 4, Studebaker 4.
15.00—Briscoe 8, Buick 6, Chalmers, Chandler, Chevrolet 8, Cole, Franklin, Haynes 6, Hudson, Hupmobile, Jeffery, Jordan, King, Kissel, Lozier 4, Mitchell, Moline, National 6, Oakland 8, Oldsmobile, Overland 6, Paige, Premier, Reo 6, Scripps-Booth 8, Stearns 4, Studebaker 6, Sun, Velie, Willys-Knight.
20.00—Cadillac, Haynes 12, Lozier 6, National 12, Peerless, Stanley, Stearns 8, Stutz, Winton 33.
25.00—Locomobile, Fiat, Marmon, Mercer, Packard, Pathfinder, Pierce, White, Winton 48.

U. S. MILITARY ROAD

Chicago, June 2—The establishment of extensive permanent as well as temporary quarters for training stations at the Great Lake station and the officers'

reserve corps camp at Fort Sheridan will result in what can be called primarily a military road between Chicago and Waukegan. The highway is to be put into condition for the operation of heavy army motor trucks, of which 150 will be employed in hauling supplies to Fort Sheridan and the naval station from Chicago.

Already the Northwestern railroad and the Chicago, North Shore & Milwaukee have offered their engineers for the work. As this stretch is organized as Sheridan road, the efforts of the Sheridan Road Improvement Association, as well as those of the military encampments and the towns on the route, will be devoted to the speedy construction of the road.

The Government is expected to spend $18,000,000 in enlarging the Great Lakes training station alone, and it is planned to accommodate 27,000 men in permanent quarters by next October. The work of establishing the military highway will be accomplished by special assessment to a large extent. Co-operation has been promised by Governor Frank O. Lowden, and an appropriation, it is said, will be asked from the present legislature. Samuel M. Hastings, mayor of Highland Park and president of the Illinois manufacturers' association, is chairman of the executive committee, while Commandant W. A. Moffett of the Great Lakes and Colonel W. J. Nicholson of the Fort Sheridan camp are ex-officio members.

NEW DIRIGIBLE MAKES FLIGHT

Washington, D. C., June 1—The Navy Department has made public the first flight by one of the sixteen non-rigid dirigibles being built for the navy. This dirigible left Chicago Monday at midnight and arrived at Akron, Ohio, between 4 and 5 o'clock Tuesday. This was merely an experimental flight and not an official test, and no attempt at high speed was made. Sixteen of these dirigibles were contracted for two months ago. The Goodyear Co. is building nine, and the others are being built by the Goodrich Rubber Co., the Curtiss Aircraft Co., and one by the Connecticut Aircraft Co. They will be used with the coast patrol. The men who will operate them are now in training at Pensacola, Fla.

SCHAFER COMPANY OPENS PLANT

Hawthorne, N. J., June 1—The Schafer Ball Bearings Co. has opened a plant in this city and is producing the Schafer ball bearings in duplication of the European product. By the end of next month it expects to produce on the average about 3000 finished bearings a day. This company is the successor to the interests which prior to 1914 imported these bearings from Europe and is backed by American capital and interests. C. Barthel is president and treasurer, M. Daly is vice-president, F. P. Lyons is secretary, and J. H. Zeller, chief engineer.

Needs 10,000 Flyers

Howard Coffin Tells Club American Army of 1,000,000 Needs 5000 Planes

British Airman Says College Men and Boys Are Best

WASHINGTON, D. C., June 1—That "it is a blind army which goes into the war without airplanes" and "in the battle in which there are twenty-eight airplanes lost there are thousands in the air" was asserted by Howard Coffin, chairman of the aircraft production board of the Council of National Defense, in an address before the University Club of Washington. Mr. Coffin says that for 1,000,000 Americans in the field there should be 5000 airplanes. Mr. Coffin expressed the view that 10,000 flyers are needed for the European war service.

France found it required 50,000 aeronautic mechanics, and Mr. Coffin pointed out that the United States troops going into the European war must depend on the aircraft of the allies until America is in position to do its turn.

The statement of Mr. Coffin is of much interest, especially when taken in connection with the recent statement by the aircraft production board, through President Hawley of the Aero Club of America, that the immediate training and equipment of 10,000 American air men for the European front had been undertaken.

The most desirable men, according to Lieutenant Colonel Rees, British airman with the British war commission and winner of the coveted V. C., are young fellows, weighing up to 170 lbs., preferably college men and boys of eighteen to twenty-five.

"They must be men of more than ordinary endurance," said Colonel Rees, "because they have great responsibility and have to be trusted to use their heads. Their integrity must be unquestionable."

Colonel Rees said that the fighting height was about to be increased from 20,000 to 30,000 ft. by the new type machines being manufactured now.

ROCK ISLAND TESTS TRACTOR

Rock Island, Ill., June 2—A new caterpillar tractor that can perform every known trick from submarine exploits to climbing trees was given a demonstration this week before a board of military critics at the Rock Island arsenal. Present were Colonel Burr, commander of the arsenal; Major Ramsey and Captain Capron of the U. S. army, and other officers. The first move was to operate the tractor into a deep clay pit, dragging a 4.7 field piece and carriages with it. Without pause it thrust its iron beak up the opposite side and waded into a deep swamp. Engine and all went under water. The machine plowed its way out without losing any of its train, and the route was retraced. Some trouble was experienced in negotiating the bank after leaving the water, but a couple of railroad ties were dropped in the path, giving the necessary footing. A steep bank was ascended. A tree 6 in. in diameter was cut off without retarding the progress of the machine. Permission was granted by the war department to film the exhibition, and the reproduction will give an idea of the power of these war tractors and their value at the front.

DREXEL DISSENSION DISAPPEARS

Chicago, June 4—Internal dissension and financial difficulties which threatened to disrupt the Drexel Motor Car Corp. have been ironed out, apparently, and according to A. J. Farmer, president and general manager, the concern will proceed on a better foundation than heretofore. Early in May, Farmer, who owns the patent on the sixteen-valve engine, said to be Drexel's most valuable asset, was asked to resign and temporarily ousted on a charge of mismanagement. This became public when two South Side banks became involved through investigations of bank examiners. One of the banks financed the Farmack Motor Corp., predecessor of the Drexel concern, and Thomas McFarland, president of these two banks, was said to be a heavy stockholder in Drexel and the Drexel organization was reported to be heavily indebted to one of these banks.

Last Saturday there was a creditors' meeting at which it was voted, according to Farmer, to withdraw all claims for the present and the matter is to be taken up with Judge Carpenter of the Federal court this week. Yesterday a directors' meeting was held at which stockholders agreed to furnish additional funds to put the concern in good financial condition. Officials who started the dissension resigned and Farmer is back at the head of the organization. The men in the plant were laid off temporarily while the difficulties were benig smoothed out, but Farmer says they will be put to work again in a few days.

Another directors' meeting will be held next Sunday.

TITAN MOTORS CO. FORMS

Detroit, June 2—The Titan Motors Co. has been formed in this city with a capital of $350,000 with A. A. Gloetzner, who is in charge of the sales, engineering and service departments of the Covert Gear Co.; Carl C. Hinkley, chief engineer of the Chalmers Motor Co., and Louis Mendelssohn, treasurer of the Fisher Body Corp., incorporators. The company will manufacture engines for trucks, passenger cars, airplanes and submarines. For the first six or eight months a temporary plant which has been leased will be used and production will start with twenty-five engines a day, which officials of the company state is a very low figure as compared to production plans a year hence. An option

has been taken on land, and construction of a factory will soon be commenced.

Carl C. Hinkley, who is chief engineer of the Chalmers Motor Co. and also head of the Detroit section of the Society of Automotive Engineers, will resign from the Chalmers company within the next few months and assume the duty of president of the Titan Motors Co. A. A. Gloetzner has been elected vice-president. William Fisher is secretary and treasurer. Directors of the company include C. C. Hinkley, A. A. Gloetzner, William Fisher, Louis Mendelssohn, treasurer of the Fischer Body Corp., A. Mendelssohn, secretary of the Fisher Body Corp., Frederick J. Fisher, president of the Fisher Body Corp., Charles Fisher, factory superintendent of the Fisher Body Corp. It is anticipated that the company will be steadily producing truck engines, on which it will first devote its energies, by Aug. 1.

INDUSTRIAL ENGINEERS ORGANIZE

Washington, D. C., June 1—A permanent organization of the Society of Industrial Engineers will be made in this city June 15. The membership consists of men and women who are industrial engineers, professional technical engineers, accountants, managing executives of commercial and industrial activity, writers, educators and students. Charles Buxton Going, for twenty years editor of the *Engineering Magazine*, New York, was chosen provisional president and pro-tem chairman of the board of directors at a recent meeting. This is comprised of fifteen prominent men from various sections of the country and includes C. B. Going; F. B. Gilbreth, industrial engineer, Providence, R. I.; E. C. Shaw, vice-president of the B. F. Goodrich Co.; Harrington Emerson, industrial engineer, New York; Charles Pioz, president of the Link Belt Co., Chicago; G. DeA. Babcock, production manager of the H. H. Franklin Mfg. Co.; H. F. Porter, Detroit Executives' Club.

Ad Tour Reaches K. C.

Six Cars Triumph Over Road Conditions Between San Francisco and Missouri

Western Motor Men Speed Through Roads of Solid Mud

KANSAS CITY, Mo., June 1—A victory of men and materials over road conditions, conquering distance and time, was shown in the arrival in Kansas City yesterday of six motor cars, five of which had come from San Francisco over the Lincoln highway since May 20.

It rained every day of this trip—except two days when it snowed in Wyoming and one day in Colorado, when it hailed. The roads were more or less solid mud all the way through, except on paved streets of towns. That the cars got through at all was a miracle of modern skill in making motor cars and a miracle of determination on the part of the members of the party. Mud was splattered all over the cars; mud in the engine, in the carbureters, in the cylinders—a mixture of mud and oil. After some cleansing at the service shops here the cars started away again at noon yesterday.

The tourists were part of the delegation of California advertising men bound for the convention in St. Louis of the Associated Advertising Clubs of the World. Fourteen cars left San Francisco May 20. Nine of them succumbed to road and weather on the way. A St. Louis car met the party at Plainville, Kan., and accompanied it to Kansas City.

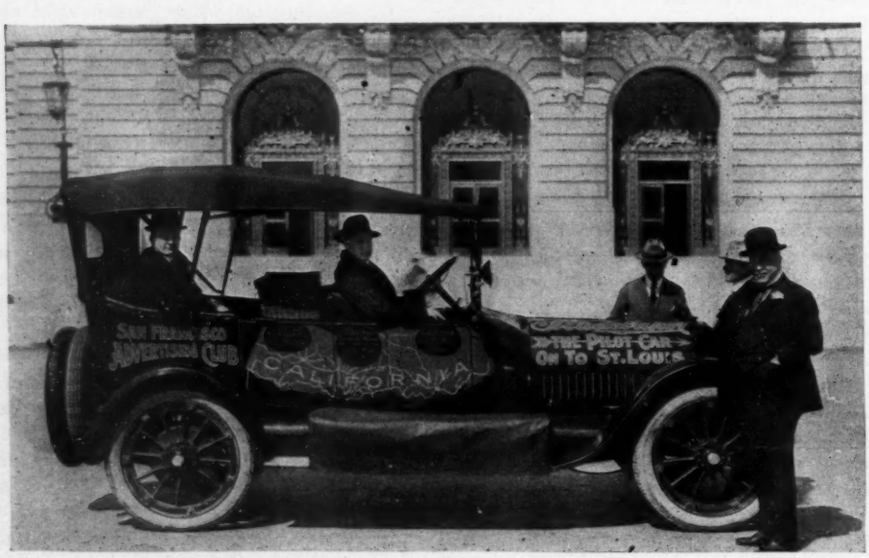
R. C. Durant, president of the Chevrolet Motor Co. of California, drove the trail blazer that came into Kansas City ahead of the rest of the party; in this car also were A. O. Plughoff, manager of sales of the Chevrolet company in California; G. A. Buckingham, also of the company, and Fred Comer, mechanician. The car was a Chevrolet baby grand. It started on to St. Louis after an overhauling.

Two Studebakers, both 18-6's, came through with practically no tinkering on the way and without the change of a tire. In one of these was Chester N. Weaver, formerly branch manager of the Studebaker Corp. in San Francisco, now president of C. N. Weaver Co., Studebaker distributor in northern California. Mr. Weaver is vice-president of the newly-organized Pacific Coast Motor Dealers' Association. With him was Charles Richman of the Johnson-Richman Service Co., San Francisco; James F. Gurley, driving. The other Studebaker was the private car of A. Bernstein, a merchant and motor enthusiast of Oakland, Cal.

The Buick that came through from the coast was from the Howard Motor Co. of San Francisco, Buick distributor. W. P. Vesper of the Vesper Buick Co., St. Louis, drove to Plainville, Kan., to meet the party. J. Frank Martin, manager of the Buick branch at Kansas City, met the party at Plainville also and drove to Kansas City.

J. A. Houlihan, secretary of the San Francisco Advertising Club, was chairman of the tour. His second in command was Hugh McKay, who was observing the roads under instructions from the war department. Willie Ritchie, former lightweight champion, came along for fun. An Auburn roadster was driven by H. F. Schaldach.

Two other cars that started from San Francisco came in a little late. They were a Pierce-Arrow fitted up as a prairie schooner by the San Francisco Call and piloted by James Hamilton and a Moreland truck, also in prairie schooner dress, bearing M. W. Ferguson, efficiency engineer of the company, and Joseph Baker.



The Studebaker pilot car of the Advertising Club's motor tour. Chester N. Weaver at the wheel, and Mayor Rolph of San Francisco at the front right wheel

KELLY JOINS HEWITT

Buffalo, N. Y., June 1—John Kelly, for years connected with the Republic Rubber Co., has resigned and associated himself with the Hewitt Rubber Co. of this city, which concern manufactures a general line of mechanical rubber goods and is planning to install a pneumatic tire department, which is expected to have an output of 5000 tires per day. Mr. Kelly will have charge of operation and sales in the Hewitt company. Also going with Mr. Kelly from the Republic company is Frank V. Springer, who has been in charge of railroad supplies for the Republic company. Mr. Kelly will be first vice-president of the Hewitt company and Mr. Springer second vice-president. The Hewitt company started the manufacture of mechanical rubber goods in 1905. H. H. Hewitt is entire owner of the plant. It is planned by Mr. Kelly to begin the production of a complete line of pneumatic tires at the earliest possible date.

55,000 See a Pageant for a Park

Thousands of Motorists Crowd Roads of Indiana to Review History of the Dunes

By Ruth Sanders

FOR many years there has been an active propaganda for the conservation of the natural beauty of the country from desecration by use of factory and mill sites or for other commercial purposes. At the threshold of Chicago is a stretch said to be second only to the Yellowstone Park in interest and beauty—that wonderful spot in Northern Indiana with its fantasmagoria of sand dunes. Right in the path of expanding commerce, this region will be lost to the people for all time unless it is made into a national park as Yellowstone and the others have been. It was to direct public interest to this plan, already recommended to Congress by Secretary of the Interior Franklin K. Lane, that the history and romance of the Dune country was told in pageant at Port Chester, Ind., Decoration Day and Sunday under the auspices of the Dunes Pageant Association.

People from all over Indiana and Illinois took part—1000 in all, including a chorus of several hundred voices and a full orchestra. Divided into two parts, the historical chronicle and the masque, the pageant was more witchery of color of Indian, soldier and mystical costume added to the witchery of strange sands. Thomas Wood Stevens, director of dramatics in the Carnegie Institute of Technology, Pittsburgh, Pa., wrote the pageant and masque; George Colburn, well known director and composer, the music.

Thousands of Cars

It is estimated that more than 55,000 persons saw the pageant in the two days it was given. More would have seen it, but the whim of Jupiter Pluvius said otherwise, and a mere handful of 15,000 braved the downpours of Decoration Day. More than 5000 cars are believed to have made the trip to the scene of the pageant. Excellent roads give access to the future park, which is only 30 miles from Chicago. So great was the travel from the city to the pageant, as well as from other points in Illinois, Indiana and Michigan, that by noon the roads leading to the site were as congested with motor cars as are the streets in the loop district of Chicago during the rush hours. Some of the cars were unable even to get within sight of the grounds.

No pageant could have been more impressive. Based on a history without a superior and with few parallels in romance and interest, the spectacle took the thousands scattered in the great dune bowl from the time that Father Marquette, the young priest-explorer, came to the southern shores of Lake Michigan on a mission to the Illini Indians to the present day of the vast metropolitan development of the country.

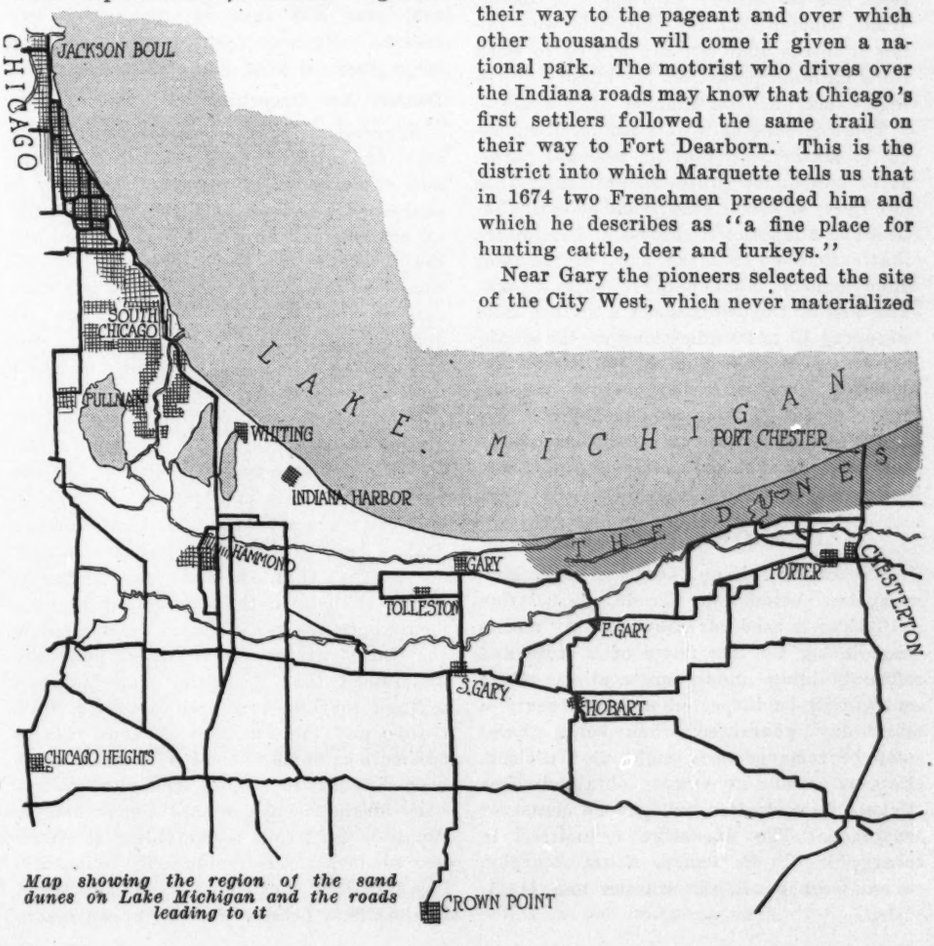
More far reaching in its effects perhaps have been the days of preparation and the days on the dunes themselves. The thousand participants in the pageant have been gathering on the dunes in practice days and weeks before the scheduled program. Other thousands of motorists have followed the historic roads to the rehearsals, and all mingled in the great pageant that preceded the drama enacted in the afternoons in the valley of sand hills opening on the lake at Port Chester. The sweeps of sand mountains nearer the lake were covered with groups in gayly colored clothes, who gathered about camp fires not unlike a vast encampment of the Indians of the earlier sand dune days.

Eighteenth century Spanish soldiers, Frenchmen and Britishers, as well as Miami, Iroquois and Mohegan Indians, nymphs and symbols of the winds and waves, clad in silver gray draperies of their representation, roamed together. Quaint costumed figures were silhouetted along the distant ridges, and the pictures of the unconscious pageant were made as unforgettable as those of the rehearsed drama. It is no more possible for one who attended to forget the beauty and interest of the sand dunes, as such, than it is to forget the romantic history that gave basis for the celebration that took place on them.

Here, as in the old days of 1675, Marquette returned from his mission to the Illini Indians to die on the shores of Lake Michigan. Here La Salle entered the Council of the Miami in the name of the King of France and flouted their enemies of the Long House. Here the British flag gave place to that of Virginia in the Revolution of the Dune country; the Spanish, marching across Indiana from St. Louis, took Fort St. Joseph; Lieutenant Swearingen, leading a troop of U. S. regulars by the Detroit-Chicago road, camped, and the City West was surveyed and Daniel Webster came.

Much can be said about the roads over which the thousands of motorists found their way to the pageant and over which other thousands will come if given a national park. The motorist who drives over the Indiana roads may know that Chicago's first settlers followed the same trail on their way to Fort Dearborn. This is the district into which Marquette tells us that in 1674 two Frenchmen preceded him and which he describes as "a fine place for hunting cattle, deer and turkeys."

Near Gary the pioneers selected the site of the City West, which never materialized



Map showing the region of the sand dunes on Lake Michigan and the roads leading to it

because Congress could not give the $5,000 necessary for harbor improvements. There was no Gary then, for Gary came later.

At Miller let the motorist remember that Lieutenant Swearingen of the First United States Artillery led his troops around the foot of Lake Michigan on a long march from Detroit to the mouth of the Chicago river. They were on their way to build Fort Dearborn. Captain Whistler, commander of the garrison, we are told, had preceded the troops in the good ship Tracy, which carried supplies for the fort, so the soldiers were able to make the trip in much less time than if they had transported the supplies, and Swearingen's diary tells that the Detroit-Chicago trail was covered in one month and three days, a trip now of less than one day for the motor car.

Road Follows Lake

The road follows the shore of Lake Michigan from the mouth of the St. Joseph river, where Swearingen stopped at "Kinzie's Improvement," now Niles, Mich.; through New Buffalo and Michigan City, past Chesterton to Porter and Miller. This was also the route of the little band of troops. Then it was a branch of the Sauk trail used by the Indians who went to Detroit and other trading stations to bargain their pelts.

Swearingen and his band camped on the site of the pageant Aug. 15, 1803. An Indian village occupied the location of Michigan City. At Miller the old Sauk trail runs into the main trail. Every foot of the road has its history of romantic timber. What wonder that the motorists who follow it to the dune site are willing to work for a national park that the history of the region may not be dimmed by commerce.

There is hope of a national park. Stephen T. Mather, director of national parks, gives unbounded praise to the sand dunes as objects of scenic beauty and scientific interest in a report to Congress and estimates that from 9000 to 13,000 acres of the sand dune country should be included in a park. The cost of the purchase of a strip a mile wide and 15 to 20 miles long on the southern shore will be from $1,500,000 to $2,000,000. The estimated cost of maintenance of the park is $15,000 a year. The dunes are accessible to 5,000,000 persons and are located in the center of population.

TO SHOW USED CARS

Minneapolis, Minn., June 1—The Minneapolis Automobile Trade Association will have a used car show in July and is negotiating for five floors of a store and office building under construction. Each entry will be inspected and will carry a seven-day guarantee when sold. Sales may be removed each night at 6 o'clock. Persons who have not obtained free tickets from dealers will pay 25 cents for entrance. The executive committee in charge is H. E. Pence, F. E. Murphy, J. A. Graham, B. E. Stimson and D. A. Odell.

Winter Slows S. A. Sales

Coming of Cold Season Decreases Business of Motor Industry in Argentine

Short Crops Have Brought Low Buying Power to Camp

BUENOS AIRES, May 10 — Winter is now coming on in Argentina, which means the slowing up in the sale of motor cars, and while there is never snow in this city it gets very cold during June and July, which are the winter months. There is frequently ice on small pools and sales correspondingly slow up.

The motor industry is not in the best of condition and has been suffering for a year because of poor crops and distress brought about by the exceptionally cold winter a year ago. In Argentina the camp, or country, represents 80 per cent of the motor car purchasing power of the country. The buying capacity of the camp, or country, depends largely on the wheat crop, maize crop and road improvement. Last year there was a great shortage of the wheat crop due to the prolonged drought and locust troubles. In spite of this there was good selling of motor cars, and those dealers who had quantities on hand had no difficulty disposing of them. One dealer representing a large U. S. A. producer sold over 300 cars in practically two months. He was fortunate in having a large stock on hand ready for delivery.

Dealers Are Uncertain

Argentina is rather uncertain as to what the entry of the U. S. A. into the war will mean so far as the motor industry is concerned. Dealers here are wondering if export of motor cars will be cut down owing to motor car factories being requisitioned by the government for the manufacture of munitions. It is expected that reduced shipping facilities and higher war and insurance lists will have their effect on limiting exports.

Dealers here are indulging in much speculation as to whether U. S. A. manufacturers, who since the war have become the sole purveyors of this market, will be able to hold the trade after the war. Gossip among dealers here to this effect is based largely on the fact that American manufacturers refuse to believe that motor car requirements here are any different from those in the United States. It is getting generally understood that American manufacturers will not continue to supply cars with 60-in. treads, and the dealers look upon this as one more example of the tendency of American manufacturers to self-glorification. Some dealers consider that the refusal to supply 60-in. treads is equivalent to American manufacturers' voluntarily relinquishing the hold they have on this market. Dealers here believe that European manufacturers have learned great lessons in quantity production during the war and that when the war is over they will meet the requirements of Argentina in quantity production.

Dealers here feel strongly on the question of 60-in. treads, as well as on that of magneto ignition. The battery is little understood in Argentina, and service buildings are not located conveniently as in the U. S. A. Here 80 per cent of the cars go onto the large farms of the camp, where they are given hard treatment and where the battery proves one of the early sources of trouble. It is because of this extreme service that Argentine dealers have been demanding the magneto. One large American manufacturer who for many months held out against fitting the magneto has now found it good business to fit it.

CARS IN ORIENT INCREASE

Cars in the Orient are coming into their own. In spite of war conditions the Hongkong government is continuing the improvement and extension of the roads of the colony so as to accommodate motor car traffic, both in what is known as the "new territory," that is, the mainland portion of the colony and on the island. Particularly as to the road around the island, work is being pushed with much vigor. There has been a heavy increase in motor car traffic in the colony, although the use of such cars will always be limited because of the restricted topographical field for them. The number of cars now in use in the colony is 105, as compared with seventy-two two years ago. The greatest change, however, is in the fact that whereas the seventy-two cars at that time were nearly all owned by public garages and were largely for tourist use, the greater part of the increase has been in private cars used by their owners for pleasure only.

The nature of business carried on in Hongkong and the limited size of the colony's business district are such that few cars ever will be used for commercial purposes. There are two fairly good sized motor trucks in use in the colony and one large baking establishment uses a delivery car of American make between its plant and its downtown office. Almost all of the cars now in use are American and it is a notable fact that most of the first private owners of cars in Hongkong were Chinese.

After sixty-six years of activities the foremost horse-vehicle landmark in China now is recognizing the steady advancement in the sale of motor cars at Shanghai. This pioneer establishment originally afforded all the facilities of a successful American livery stable, subsequently added a coach-making department under the supervision of a number of foreigners, employing 350 skilled Chinese workmen. More recently the coach builders have been extensively employed in making motor car bodies ranging from commercial vans and small runabouts to elaborate limousines.

New Texas Motor Law Is Drastic

Taxation Plan Comprehensive—Levy on Ford $17.25; Other Cars in Proportion

ON JULY 1, Texas' new motor and bus law becomes effective. Under this law there will be a change in the registration of cars. It means that cars will be numbered by the state instead of by the counties. It means too, that car owners must pay into the coffers of the state between $5,000,000 and $6,000,000 annually in taxes. Of this amount more than $1,500,000 will go for the betterment of the county roads, under the state highway commission bill.

The average car owner, whose car has a taxable valuation of $450, must pay a total tax of $23.10, plus the war tax. The Ford car owner, whose car has a valuation of $250, will be compelled to pay to the state, county and city a tax of $17.25 annually. This figure is based on the following: Tax, 35 cents per horsepower, all cars figured at 20 hp. or over, amount $7.50; state and county tax, average $1.10 per $100 valuation; city tax rate, average $1.80 per $100 valuation plus the $3 registration fee.

Estimate Revenue at $5,000,000

The estimate of the total tax valuation of more than $5,000,000 is based on the estimate that 260,000 cars are in operation in Texas, the tax to be as follows:

Tax of 35 cents per horsepower, every car having average of 30 hp	$2,730,000
State tax rate of 60 cents per $100 valuation, each car to have a valuation of $450, average $2.70 per car, total of	702,000
County tax rate average 54 cents per $100 valuation, total $2.43 per car or a grand total of	631,000
City tax rate average for thirty largest cities of the state where it is estimated 40 per cent of cars in Texas are in operation, tax rate averaging $1.80 per $100 valuation, each car having valuation of $450 with 94,000 cars in operation, a grand total of	761,400
License fee of $3 per car, a grand of	801,000
Grand total for all character of taxes	$5,625,400

This estimate, it is pointed out by the state department, is based on an exceedingly low valuation and it is thought when the assessments are made there will be great increases. The tax rate for a 50-hp. car and a valuation of $1,000 will be a total of $49.50. It is pointed out, however, that the percentage of high-priced cars compared with the number of low-priced cars in the state is exceedingly small.

By the time this law is effective, July 1, the members of the state highway commission are to be appointed. Deputies will also be named and the work of registration will immediately begin. Failure properly to register means the filing of misdemeanor charges, fines therefor to range from $10 to $25. The funds derived from these fines are to go to the state highway commission and will be used for the betterment of the highways.

In addition to this fee for passenger cars the law fixes the annual license fee based upon the carrying capacity per wheel as follows:

Weight in pounds per wheel	Fee
1001 to 2000	$ 20
2001 to 4000	40
4001 to 6000	60
6001 to 8000	150
8001 to 10,000	300

For loads greater than 10,000 lbs. per wheel license fees shall be charged for each vehicle at the additional rate of $500 for each 1000 lbs. increase in weight, or fraction thereof.

There are other salient features of the law. The most important are these:

Every car or motor vehicle shall carry a state number, showing the words, "Registered Motor Vehicle, Texas." Heretofore the numbers have been issued by the respective counties of the state.

Every car shall display this license plate and number in the front and rear of each car.

For the remainder of this year, from July 1 to Dec. 31, each car owner will be compelled to pay half the annual fee and tax for his car.

Any manufacturer or dealer in motor vehicles, may in lieu of licensing each car take out a general license number for a fee of $15.

Non-residents Exempt 90 Days

Motor vehicles from other states are exempt from the provisions of this act for a period of ninety days, upon proof they have complied with the motor vehicle laws of some other state. However, if he remains in the state for thirty days he must pay a fee of $1.

This law is said to be one of the most drastic in the United States. It is an unusually lengthy bill and the constitutionality of it has been questioned, although this question has never been carried into the courts. It is very likely, however, after July 1, the questions involved will be tested by court action. It is claimed by some that the state constitution prohibits the levying of fines against persons for road building.

PHOENIX WORKS PARKING PUZZLE

Phoenix, Ariz., June 1—Ranking of cars along the curb on some streets and parking in the center of others at right angles to the lines of traffic are the two methods which have been adopted by City Manager Robert A. Craig in an attempt to solve the parking problem for Phoenix. All vehicles stopping at the curb on all the streets are required to stop parallel to the curb and not more than 1 ft. distant. On streets where stalls are provided for parking in the center, only 20 min. is allowed for parking at the curb during business hours.

Twelve blocks in the business district have been laid out for parking in the center of the street, the lines marking the stalls being painted in white on the pavement. Under the regulations prescribed by the city manager all vehicles must be driven into and out of such stalls only by following the directions for traffic, and in no event is any car to be backed out of a stall.

Complete authority to prescribe parking regulations and to vary them from time to time by giving proper notice has been vested in the city manager by the city commission. The ordinance which provides that the city manager may prescribe the parking rules carries a penalty of both fine and imprisonment, the fine not less than $5 and not more than $200 and imprisonment for a period of not more than 200 days.

SAVANNAH RESTRICTS TRAFFIC

Savannah, Ga., June 1—Pedestrians in congested districts of Atlanta, as well as the procedure of motor car drivers in discharging passengers and parking cars, are affected materially by the new city ordinance now in effect. Pedestrians must not attempt to cross a street when the traffic officer signals that vehicles must stop. A man may not proceed when traffic is held up in the same direction he is going but must wait for the flag to give him the signal to proceed. When a street is opened for traffic one way pedestrians may not dodge among the stream of cars and cross at right angles.

No motor car can back into a curb except to discharge or pick up passengers, and then can remain in this position only long enough to discharge or pick up same. All cars must park parallel to the curb, and there are very few downtown streets on which a car may park. No taxicab may park on any street in the city, except in front of railway stations, and private cars doing service for hotels, and in the latter instance only, by consent of the stores which may be on the same floor with the hotels.

The limit of fines for violations of the traffic ordinances has been doubled, and from now on the recorder may assess an offender $50 or thirty days.

Why Industry Will Lose Few

Factories to Need Majority of Automotive Men More Than Field During War

THAT Government control of civilian life during the war would increase but that the automotive industry would only have to provide a small number of men for fighting was the prediction of K. W. Zimmerschied addressing the Detroit section of the Society of Automotive Engineers May 26. The majority of men, even of military age, will be needed in the factories more than in the fields was the reason given for the forecast. Since Mr. Zimmerschied is now in charge of the S.A.E. office in Washington, established to enable the society to work for the Government with the greatest expedition he is well able to speak of these matters.

Mr. Zimmerschied gave the diagram, Fig. 2, as an illustration of the manner in which governmental control increases during war.

In the first stage, A, the military activities are a small part of the total; civilian activity for the military represents another small part of the whole, and natural activities are not much curtailed. Government control affects little but the strictly military.

Civilian Control Begins

Later, in stage B, the sum total of the activities shows a marked increase. Natural activities, however, have decreased. Military activities, and activities affecting the civilian, have shown a great increase, as has government control. This is the stage where government control is placed on gasoline, passenger car use and the like.

In stage C, though the sum total of activities has materially increased, a still further decrease is noted in the natural activities. All other activities show an increase, as does government control.

1—The Effect of Conscription. Every man from 21 to 31 will register, which means about 250 out of 3000 inhabitants, that is, one man out of every ten or twelve. On this basis there is little danger that the automotive industry will be seriously harmed by the draft. The possibility for harm is still further decreased by the fact that anyone necessary to the industry may be exempt—and considered to be giving service equivalent to service on the firing line. This has been the practice in England and has been found very satisfactory.

The following are some of the figures estimated on a basis of 5000 men: Out of 5000, 2000 will register. Of this 2000, 200 will be drawn. Of this 200, 20 might possibly be exempt because of manufacturing necessity. Hence out of a plant employing 5000, the chances are that not more than 200 will be drawn.

2—The Raw Material Market. All disposition of raw materials is subject to the action of the priority board, which is under the council of national defense. This board first looks out for military need, examines cases of complaints and orders sources of supply to furnish the raw material as deemed necessary. The Interstate Commerce Commission is working in harmony with this board.

Though the priority board is at present chiefly interested in material directly related to munitions, it may later interest itself with the more remote sources of raw material. Under this head would come tractors, farm implements, etc., as affecting the food supply. Also, it would not permit any source of livelihood to be destroyed by war conditions, thereby throwing any one community into dependence.

No fixed priority policy is possible because conditions vary from time to time. This board is co-operating with the French and British, and while conditions are not the same in all three countries, this commission will see that the American industry is protected.

3—The Place of the Industry in War. To-day the automotive industry is vitally necessary to the carrying on of war. It holds the key to the transport situation and renders a quick movement of troops and supplies possible. The first question the industry is asking is how much material is needed and where is it needed.

The Quartermaster Corps uses two types of general purpose trucks—type A of 1½-ton capacity and type B of 3-ton capacity. Due to the construction, the overload capacity of type A is 3 tons, and of type B, 5 tons. A complete booklet describing the specifications of these trucks is now ready.

At present from 35,000 to 40,000 of these trucks are to be used, in the ratio of six type A trucks to one type B.

In the ordnance department the requirements for trucks are different. Any truck mounting armor plate is considered to belong to the ordnance department, as well as tractors for guns, a few armored cars, and tanks.

Armored cars have not proved satisfactory in the present war. Tanks have been more so, but must be developed. The first British models bear about the same relation to the tanks of to-day as did the first motor car to the present-day car. A board consisting of three army officers and one civilian is at present making tests on some government tanks, and the American tank will be developed as fast and as well as circumstances permit.

Each division of 28,000 men will require 625 trucks, forty-eight ambulances and twelve airplanes.

The Engineer Corps uses trucks about the same as the Quartermasters' Department. These constitute wrecking, erecting and specially equipped trucks suitable for bridge building and other engineering work.

Under the signal corps is the aviation corps; hence the signal corps uses many trucks of the quartermaster type, trucks equipped with wireless, trucks for raising and lowering captive balloons, repair trucks, trailers and airplanes.

Though there has been no little fear and speculation on the development of the airplane in the United States, there is little cause to worry. Progress has been slow but taken up in a logical manner. The first problem was that of getting pilots, next to get machines in which to teach the pilots and third to get a sufficient supply of war planes.

Military Training Necessary

Experience on the continent has proved that military training is the first requirement in the development of an aviator. In the Canadian contingent this was not done at the beginning of the war, and it was found that the fliers were too independent and lacked military training. The flier must first be a soldier and next an aviator.

Aviation schools are being founded all over the country. There will be schools at Berkeley, Cal., Cornell University, University of Texas, University of Illinois, University of Ohio and University of Massachusetts. At present the course lasts from one month to six weeks, though later it will extend through a period of two months. The student receives instructions in meteorology, aero-dynamics, physics and on about twelve subjects as the basis of flying. At the same time he is receiving military training and preliminary instructions in flying. There are some few university graduates who have had this preliminary trainnig. These were accepted by the aviation department and are now in the existing schools.

Funds have been appropriated for many fields to be used in airplane instruction. The three first are the Joy field at Mount Clemens, a field at Dayton, Ohio, and another at Champaign, Ill. Doubtless inside of three months these fields will be going full blast, getting the second and third line recruits in order.

A complete flying squad comprises twelve airplanes and 174 men. Hence, if 1000 planes were in use the aviation department would require 173,000 especially trained men. Each school field has about two

squadrons, 144 cadets, 600 enlisted men, 48 non-commissioned officers, 36 commissioned officers, 24 instructors, and 72 airplanes; within the next twelve months, 3500 airplanes will be constructed for instruction purposes. This will be enough to care for all the fliers.

The requirements for the war planes are much higher than those for the instruction planes. The two difficulties confronted are that there are few expert workers on hand and that the engines are very hard to build. Our task is to make airplane engines on a production basis. Concerning the war planes, plans are not so definite as with the instruction planes, but the country has nothing to fear. When our real army goes it will have its full quota of well-equipped fliers and airplanes.

4—Activities in Farm Tractors. There is a committee on farm tractors getting behind the manufacturer, protecting labor, and providing for plenty of tractors. Farmers must be taught to operate the tractors after they are built, and neighbors not individually having farms large enough to merit a tractor will be grouped together to use a community tractor. It is estimated that the tractor will increase the grain yield 500,000,000 bus. This will be 50 per cent increase of the maximum 1917 production. In addition the Department of Agriculture is working night and day and cooperating with the British.

In closing, Zimmerschied stated that vast problems are confronting us—that mistakes will be made—but in the end we shall come out three times the victors.

CLARKSON ON S. A. E. WORK

Washington, D. C., June 2—Discussing a conference between representatives of the Society of Automotive Engineers and War Department officials touching truck specifications, especially in connection with bids soon to be opened in Chicago for 70,000 trucks, Coker F. Clarkson, general manager of the society, made this statement:

The automobile engineers have cooperated even beyond expectations in the formulation and putting into effect of military truck specifications for the War Department. For over a year the Society of Automotive Engineers has, through its various committees, been working with the Quartermaster General's office and the War Department Motor Transport Board in the preparation of specifications which have been issued recently in booklet form in connection with the request for bids from manufacturers to furnish 70,000 military trucks.

A two-day meeting was finished tonight in the rooms of the advisory committee of the Council of National Defence, representatives of engine, transmission and truck manufacturers being present. As a result of this meeting the very important and highly valuable decision has been arrived at that the engines and transmissions to be used in many of the military trucks will be interchangeable, without regard to the particular make of transmission and engine.

This will not only facilitate the putting of the necessary number of trucks into service but will decrease greatly problems connected with the replacement of parts and the making of emergency repairs in the field. The details of this fundamentally important plan are being followed up, and weekly meetings will be held in Detroit and Washington in cosummation of it. The manufacturing considerations which engine, transmission, axle, radiator and frame manufacturers encounter will be reconciled to a degree not heretofore thought possible. Among those attending the meetings were:

George W. Dunham, president of the Society of Automotive Engineers; John G. Utz, chairman of the standards committee; K. W. Zimmerschied, past chairman of the standards committee and chairman of the automotive committee of the Advisory Commission of the Council of National Defense; Capt. W. M. Britton, motor transport engineer of the Quartermaster General's office; Coker F. Clarkson, general manager of the Society of Automotive Engineers; A. W. Copland, chairman of the transmission division of the S. A. E.; W. A. Frederick and G. W. Yeoman, Continental Motor Mfg. Co.; H. L. Horning, Waukesha Motor Co., R. J. Bryce; the Buda Co., A. F. Milbrath; Wisconsin Motor Mfg. Co.; O. J. Strayer, J. M. Cook, E. O. Spillman, Herschell-Spillman Co.; E. P. Reber, Cotta Transmission Co.; E. W. Miller, Fellows Gear Shaper Co.; A. C. Bryan, Duration Gear Co.; L. C. Fuller, Fuller & Sons; H. W. Chapin, A. E. Parsons, Brown-Lipe Gear Co.; A. A. Cloetzner, Covert Gear Co.; L. P. Kolb, Kelly-Springfield Motor Truck Co.; C. B. Rose, Velie Automobile Co.; R. W. Austin, Gramm-Bernstein Motor Truck Co.; E. E. Wemp, Denby Motor Truck Co.; W. A. Olen, R. M. Newbold, Four-Wheel-Drive Auto Co.; J. E. Cramlich, Sanford Motor Truck Co.; G. V. Doremus, Service Motor Truck Co.; K. K. Hoagg of the Washington S. A. E. office.

Never before in the history of the automotive industry have various commercial interests so effectively and completely given up all individual considerations for the purpose of evolving a product with nothing in view but the common good. In so doing the industries involved have contributed their total resources to the successful prosecution of the war. The value of the work is greatly increased by the fact that the trucks involved are not only of great military value but will be particularly satisfactory for commercial use, principally for owners of large fleets in cities.

This magnificent piece of work therefore insures that when the American army finally appears on the field of battle in France it will be equipped with motor trucks which for quality of design and reliability of performance will be superior to the truck equipment of any other army that has ever taken the field.

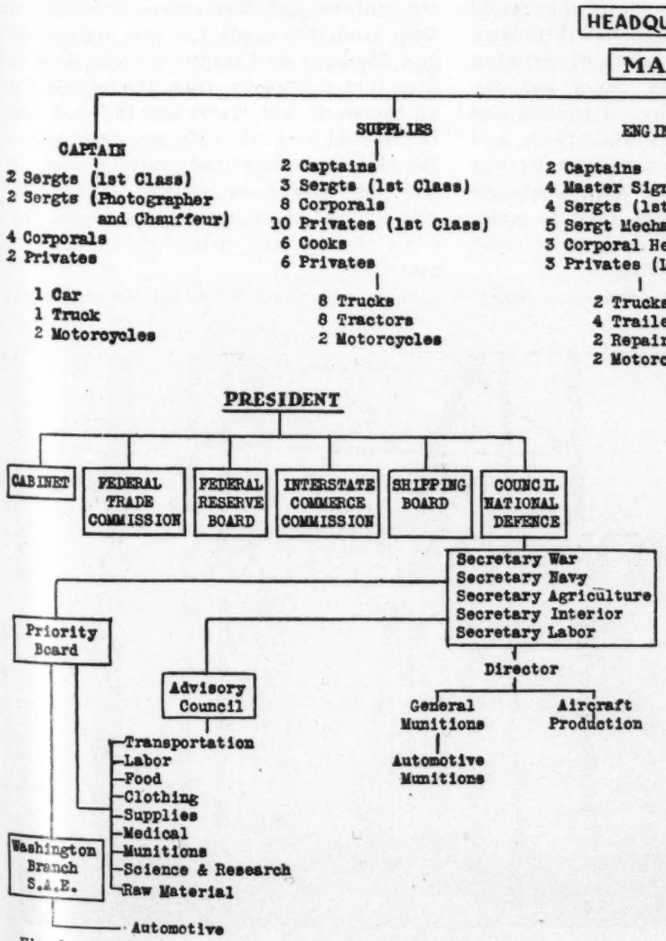


Fig. 1—Diagram of wartime organization, showing plan of automotive industry in war work

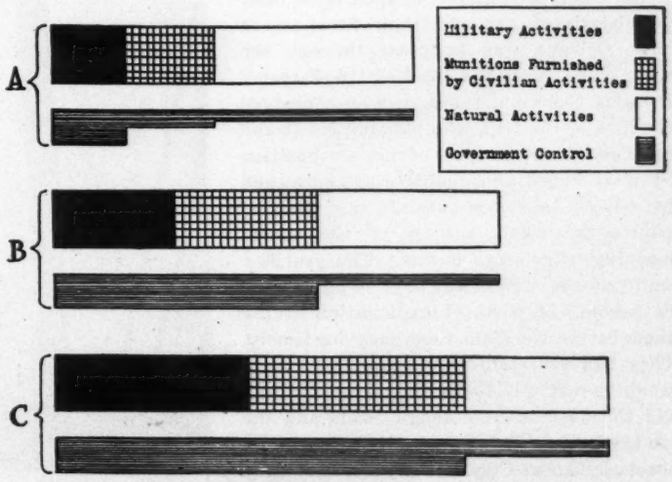
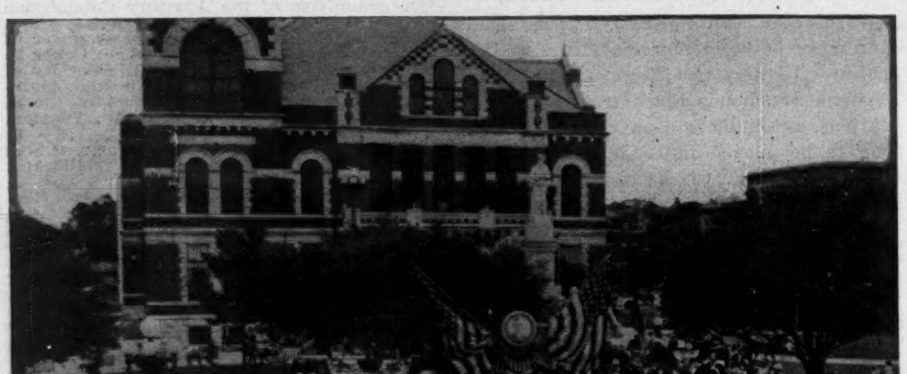


Fig. 2—How government control increases during war, as outlined by Mr. Zimmerschied

Jefferson Trip Is Made on Schedule

Proves Military Efficiency of Road from Pine to Palm



A section of the great crowd at Shreveport, La.

NEW ORLEANS, La., May 31—The Jefferson Highway Sociability run party turned the corner of Canal and St. Charles street at the moment a neighboring clock chimed the hour of six. Forty-five seconds later the lead car, with General Manager Clarkson at the wheel, stopped in front of the St. Charles hotel, and the second car with the Canadian party from Winnipeg was 6 ft. behind. They had reached the last point on the Jefferson highway, the corner of St. Charles and Common street, 15 sec. ahead of a schedule which was prepared 60 days before they left Winnipeg, the northern terminus, on the morning of May 14. St. Charles street was packed with people offering a welcome such as only the people of the Crescent City know how to tender, but the Canadian members of the party had another thought.

With one accord they hopped from their dust-begrimed car and their first act in New Orleans was to press through the throng and grasp the hand of "Jefferson" Douglas Clarkson, the man who conceived the idea of the trip, who planned for it and arranged for it in spite of some opposition by weak-kneed and doubtful brethern, and to whose toilsome but always cheerful efforts the whole success of the epoch-marking pilgrimage is due. The gratified smile of the "good old boy" was a thing to behold. A word of explanation of the thoughts of the Canadians may be timely. They had been told in Winnipeg that they would never get to St. Paul, but if they did the dust and the rough roads and the mud would make them quit before they reached Kansas City. In Kansas City they were told that the Interstate Trail had brought them that far, but that from there south they would bump into troubles they never dreamed of and that it would be impossible to keep schedule if they could keep going at all. In Oklahoma there were people who shook their heads wisely when the subject of roads in Texas was discussed, and in Texas Mayor Davidson was advised to buy rubber thigh boots and carry emergency rations because he was sure to come to grief in some Louisiana swamp and would have to trust to mules and niggers to get him to where he could draw a respectable breath again.

In Shreveport it was the same story. Northwestern Louisiana roads were all right, but the road to Melville was impossible and the Atchafalaya river could never be crossed by any heavy car. So said the mourners.

Melville was reached ahead of schedule; the Atchafalaya was crossed without trouble, Baton Rouge was reached ahead of schedule in spite of rough going and dust, and finally New Orleans was made on Thursday through terrific dust owing to the abnormal dry spell of the last three weeks. It may be mentioned that never after the first day did the Canadians entertain any doubt of making their destination on schedule, but nevertheless their congratulations to General Manager Clarkson were heartfelt.

Every kind of road that was ever invented was encountered by the party from Shreveport south. There were stretches of sand and gravel over which 40 miles an hour was easy. There were pockety mud stretches that rattled cars and occupants to the marrow and there were stretches of deep sand that made the cars simply eat gas. The light mud roads were 6 in. deep in dust that flushed up from the wheels for all the world like water and the cars had to travel at long intervals, especially where the high levees kept the grateful wind off and the dust hung suspended in thick clouds, but where roads were worst the news of new and better roads was reassuring.

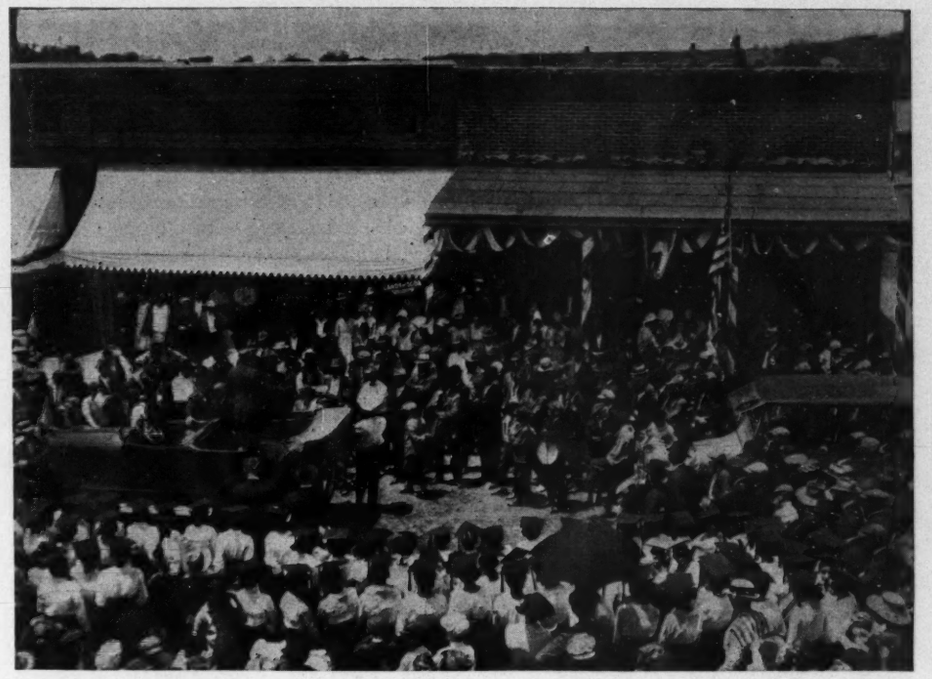
In most parishes bonds for the new work

On the Red River bridge going into Texas from Oklahoma

have been voted, in many places the surveyors have completed their work, in some places the workers were actually on the job. Practically everywhere the work is planned and provided for. The next year will see a wonderful change for the better. After long years of indifference the people of Louisiana along the Jefferson highway are at last alive to the benefits and advantages of good roads, and they are going to make the highway throughout the Pelican State equal to any on the long stretch from Pine to Palm. They have far to go for their top material but they have first-class engineers directed by a live commission and the parishes are voting the money. The result is certain.

Owing to the fact that communities in Louisiana along the Highway are strung out and most towns are small, the party made fewer stops and speaking took place at fewer places than at any other stage of the journey, but the evidences of interest in the coming of the party and in the work of the Highway Association were just as abundant as elsewhere. Natchitoches, the noon stop on Monday, turned out a very large crowd and it was very demonstrative. Colfax had the whole population out and gave glowing promises of the reception which awaits the return party. Entering Alexandria more than 100 cars joined the procession and an immense crowd heard the speakers. In the evening there was an unprecedented gathering of the business men of the city at the banquet arranged by the Association of Commerce. Bunkie, the noon stop on Tuesday was celebrating Highway Day with all stores and schools closed and scores of cars were in from the surrounding district.

Melville, where the party rested over night, gave a noisy reception and real southern entertainment. A crowded meeting was followed by an old-fashioned fish-fry with the classic and revered "Court Bouillon" as the chief dish. Following that there was a dance to which the folk for twenty miles had gathered and for which the best colored band in the state had been specially imported. The Canadians enjoyed their night at Melville immensely. Wednesday was an easy day despite the dust, as they had to make only 48 miles, much of which was over perfect gravel road. The Mississippi Swamp, famed in story, and undoubtedly the basis of some of the discouraging advices of people farther north, proved to be easy going. It has a well graded mud road, most of it recently dragged, and an average of 20 miles an hour shows that it offered no obstacles. This stretch will be gravelled very soon. The ferry at Baton Rouge was reached at 11:30 and the crossing to the east side of the Father of Waters was impressive.



Some of the interested at Eufaula, Okla. There were many gatherings like this

The big ferry let loose its great horn when the party appeared at the crest of the approach and the chorus was taken up by the whistles of all the factories and mills and all the locomotives in the railway yards of Baton Rouge. The din was deafening. Hundreds of people came running to the ferry slip and a long line of cars, headed by the fire department, with sirens and bells and screechers busy, followed the party in a procession through the city. A short informal reception at the State House left the party to their own devices until the evening when a big banquet at the Youree Hotel was attended by over 125 of the leading citizens of Baton Rouge.

The successful completition of the Jefferson Highway Association Double Relay Sociability Run from Winnipeg to New Orleans on schedule time marks an epoch in the history of the motor car in America no less than it provides striking evidence of the progress of the good roads movement.

From Shreveport

Shreveport, La., May 27—With the exception of two days in terrific mud and occasional heavy rain out of Kansas City the official cars of the Jefferson highway relay-sociability run, Winnipeg to New Orleans, have been on the dot of schedule time all the way to Shreveport. There was one other exception. On Friday, May 25, the party was 40 min. late into Mt. Pleasant, Tex., owing to rough detours from the highway where work on new highway is under construction. That is the sort of

The only spot where the mule or horse figured—Coming off the ferry crossing Canadian river, Texas

delay that members of the party do not grumble about because it shows that the work is being done and that the great hope of the association, a hard-surfaced road all the way from Winnipeg to New Orleans by 1919, bids fair to be realized.

The party left Kansas City Monday morning, May 21, on schedule, but it had rained all Sunday afternoon and most of the night and they were in heavy going at once. They ploughed along, losing schedule all the time, and at one time altogether lost Premier Norris who was in a relay car. When they got into Nevada, however, they found him addressing a big meeting. He had hopped a handy train after his car had lost its way. The speakers took the night train into Joplin, Mo., and the cars traveled until 3 a. m. into Carthage. They started again early in the morning and made Joplin 3 hrs. after they should have been leaving. After a short rest the cars proceeded, the speakers having gone by train to Vinita where they received a rousing welcome. The cars passed through Vinita while the meeting was in progress and reached Muskogee without further trouble. Out of Muskogee they were on schedule and have been ever since with the exception of Friday afternoon as noted.

Trip Well Planned

The battle with the mud on Monday and Tuesday proved the thoroughness of arrangements for the trip at every stage. Relay cars came all the way while relay drivers and mechanicians stayed with the official cars and spelled the regular drivers. Two blowouts was the sum total of the accidents in the heavy going. Since then the relay escorts have been large all along the road, but have never been needed.

Through the whole of Oklahoma the weather was cold and cloudy. The sun shone in Texas and it was warm going into Mount Pleasant. Louisiana gave the party a warm welcome in more ways than one, as the heat was almost oppressive yesterday afternoon.

The enthusiastic welcome which greeted the party at every stage of the trip in northern territory has grown steadily as progress has been made southward. It reached its climax at Shreveport, where 10,000 people in Texas street blocked street car traffic for over an hour while speaking was in progress. Interest in the trip has grown steadily, gaining momentum probably because news of its success has preceded the party from day to day through the newspapers. People now know what is awaiting them, and the great numbers in which they turn out is the best evidence that they want what they are expecting. Talk about the Jefferson is listened to with interest, but it is the talk of Premier Norris and Mayor Davidson on the war and Canada's actual experience in war and their appeal for individual realization of its seriousness that appeals to the imagination and arouses the wholehearted enthusiasm of all who hear them.

Prominent men have joined the party at different points and accompanied them for varying distances. D. N. Fink, president of the Jefferson Highway Association, joined the party at Kansas City and was with them two days to McAlester, Okla. His home is in Muskogee. W. N. King, vice-president of the association for Texas, joined at Denison with Julian C. Field, consulting engineer to the highway for Texas, and both came through to Shreveport. With them was J. F. Reynolds, mayor of Pittsburg, Tex. Paul Nesbitt, speaker of the Oklahoma House of Representatives, joined at Muskogee, with Mrs. Nesbitt, and came through to the state line. W. F. Dodd, highway director for Texas, came from Caddo to Greenville. Fred Horton, director for Texas, came from Denison to Sulphur Springs. Governor Ruffin G. Pleasant of Louisiana came to Shreveport and motored out 15 miles with the reception committee to greet Premier Norris and welcome the party into Louisiana. He accompanied them to Mansfield this afternoon. Governor Pleasant made impressive speeches at Greenwood and Shreveport and joined the party at dinner Saturday night in Shreveport.

Leaving Shreveport Sunday afternoon for the 42-mile run to Mansfield, the night stop, the official cars were followed by an escort of more than 10 miles of Louisiana cars, running with only comfortable working space between them. In many respects it was the most spectacular feature of the whole trip and an index of the great enthusiasm which the visit of the Canadian officials has inspired.

From Kansas City to Shreveport the party has run over all kinds of roads, some of the finest sand and gravel road possible. This is especially true of the roads in Texas. There have been some rough stretches, but not a foot on which a good permanent road could not be built at reasonable cost. In most places the appropriation has already been made, in many of them contracts have been let and in many work is now under way. People everywhere have been found to be strong for the Jefferson highway and determined to make their section of it up to standard. The idea of a national and international highway from north to south has touched and impressed the imagination of big men. They see more than their own local part of the road.

The Jefferson highway is not yet a highway. It is not a road. It is something bigger and better. It is an idea that is surely seizing the minds of men and spurring them to big work and big expenditures. Soon the idea will have blossomed into a reality and the Jefferson highway will have become what General Manager Clarkson set as the only goal of his ambition, a 365-day highway from pine to palm, from north to south, from Canada to the Gulf, spanning the whole of the temperate zone and providing a pathway over which the tourist may wander at his will with nothing more to dread than that he may have to fasten on side-curtains if it rains.

Mayor Davidson has even a greater vision. He sees clearly a day when the motor car will be disputing the right of way with the train as a means of locomotion for the business man wishing to travel long distances in short time, and he sees in the Jefferson highway, when completed, a demonstration which will mean networks of such highways cutting the continent from all directions and at all angles.

Answers to Inquiries

Dallas, Tex.-Anderson, S. C.

DALLAS, Tex.—Editor MOTOR AGE—Give best route from here to Ander son, S. C., and approximate mileage.—H. P. Sitton, Jr.

From Dallas proceed to Mesquite, Forney, Terrell, Elmo, Wills Point, Myrtle Springs, Ben Wheeler, Edom, Tyler, Winona, Friendship, Gladwater, Longview, Marshall, Scottsville, Jonesville, Waskom, Greenwood, Flournoy, Shreveport, Minden, Athens, Arcadia, Simsboro, Ruston, Choudrant, Calhoun, Monroe, Bastrop, Oak Ridge, ferry across Lake LaForche, Girard, Rayville, Holly Ridge, Delhi, Quebec, Tallulah, Delta, Mississippi River ferry, Vicksburg, Edwards, Bolton, Jackson, Brandon, Fannin, Pisgah, Morton, Forest, Newton, Hickory, Chunky, Meridian, Cuba, Ala., York, Livingston, Coatopa, Moscow ferry across Tombigbee river, Demopolis, Faunsdale, Uniontown, Blalock, Safford, Martin Station, Orrville, Hazen, Beloit, Selma, Benton, Lowndesboro, Burkville, Montgomery, Mount Meigs, Shorter, Tuskegee, Notasulga, Loachapoka, Auburn, Opelika, Beulah, Langdale, Layent, Ala., West Point, Ga., Lagrange, Hogansville, Trimble, Grantville, Moreland, Newman, Palmetto, Union City, Fort McPherson, Atlanta, Druid Hills, Decatur, Ingleside, Clarkston, Stone Mountain, Snellville, Grayson, Between, Monroe, Athens, Ila, Franklin Springs, Royston, Hartwell, Brown's ferry across Savannah river, then on to Anderson.

Vols. 7 and 6 of the Automobile Blue Books, published by the Automobile Blue Book Pub. Co., 910 South Michigan avenue, Chicago, contain complete running directions for this trip.

Memphis, Tenn.-Atlanta, Ga.

Memphis, Tenn.—Editor MOTOR AGE—Give route from here to Atlanta, Ga. What equipment is necessary?—J. M. King.

From Memphis go to Raleigh, Bartlett, Ellendale, Arlington, Gallaway, Braden, Mason, Stanton, Brownsville, Harvey, Jackson, Rollins, Springcreek, Terry, Huntingdon, Camden, Tennessee River ferry, Trotter's Landing, Hustburg, Waverly, McEwen, Dickson, Charlotte, Bellburg, Pardue, Cumberland River ferry, Ashland City, Bordeaux, Nashville, LaVergne, Jefferson, Walter Hill, Murfreesboro, Deason, Shelbyville, Bellville, Fayetteville, Tenn., Hazel Green, Ala., Huntsville, Owens Cross Roads, New Hope, Cottonville, North, Tennessee River ferry, Guntersville, Albertville, Boaz, Mountainboro, Attalla, Alabama City, Gadsden, Rome, Ga., Cartersville, Emerson, Allatoona, Acworth, Kennesaw, Marietta, Smyrna to Atlanta.

Vol. 6 of the Automobile Blue Book published by the Automobile Blue Book Pub. Co., 910 South Michigan avenue, Chicago, con-

tains complete running directions for this trip.

We cannot advise you as to equipment, as so much depends on individual demand, whether the tourist plans on camping, making the trip slowly, etc. The above trip is not a very long one, being a little less than 600 miles.

Abilene, Tex.-Ashley, Mo.

Merkel, Tex.—Editor MOTOR AGE—Give a route from Abilene, Tex., to Ashley, Mo.—G. E. Comegys.

From Abilene drive to Hamby, Albany, Woodson, Throckmorton, Elbert, Padgett, Olney, Archer City, Wichita Falls, Burkburnett, Randlett, Lawton, Fort Sill, Apache, Anadarko, Verden, Pocasset, El Reno, Yukon, Packington, Oklahoma City, Depew, Bristow, Kellyville, Sapulpa, Bowden, Red Fork, Tulsa, Collinsville, Claremore, Sequoyah, Bushyhead, Chelsea, Catale, Venita, Miami, Commerce, Lincolnville, Baxter Springs, Lowell, Galena, Joplin, Galesburg, Nashville, Liberal, Brenaugh, Moundsville, Nevada, Horton, Arthur, Rich Hill, Butler, Adrian, Archie, Harrisonville, Kansas City, Independence, Levasy, Wellington, Lexington, Waverly, Grand Pass, Marshall, Arrow Rock, Booneville, ferry across Missouri river, New Franklin, Rocheport, Columbia, Stephens' Store, Concord, Shamrock, Martinsburg, Middletown, New Hartford to Ashley.

Vol. 7 of the Automobile Blue Book, published by the Automobile Blue Book Pub. Co., 910 South Michigan avenue, Chicago, contains running directions on the above trip as far as Columbia.

Superior, Wis.—Montpelier, Vt.

Superior, Wis.—Editor MOTOR AGE—Give routing from here to Montpelier, Vt., with change of route for return trip.—H. R. Corey.

From Superior drive to Itasca, Hawthorne, Lake Nebagamon, Barnes, Drummond, Bibon, Ashland, Marengo, Mellen, Glidden, Butternut, Phillips, Ogema, Chelsea, Medford, Wausau, Tilleda, Thornton, Shawano, Green Bay, Denmark, Manitowoc, Newton, Sheboygan, Port Washington, Milwaukee, Cudahy, South Milwaukee, Racine, Kenosha, Waukegan, North Chicago, Highland Park, Evanston, Chicago, South Chicago, Highland, South Gary, Hobart, Wheeler, Valparaiso, Westville, Laporte, South Bend, Kishawaka, Elkhart, Goshen, Benton, Ligonier, Brimfield, Kendallville, Edgerton, Ohio, Bryan, Wauseon, Crissey, Toledo, Lemoyne, Woodville, Clyde, Monroeville, Norwalk, Townsend, Wakeman, Oberlin, Elyria, Cleveland, Willoughby, Painesville, Geneva, Ashtabula, Conneaut, Girard, Erie, Moorheadville, North East, Pa., Ripley, Westfield, Portland, Lamberton, Fredonia, Sheridan, Silver Creek, Brant, Angola, Bay View, Buffalo, Williamsville, Batavia, Caledonia, Lima, Canandaigua, Geneva, Seneca Falls, Auburn, Sennett, Camillus, Syracuse, Manlius Center, Chittenango, Canastota, Oneida Castle, Vernon, Utica, Frankfort, Ilion, Herkimer, Little Falls, Nelliston, Palatine Bridge, Fonda, Tribes Hill, Amsterdam, Scotia, Schenectady, Albany, Troy, Raymerstown, Potter Hills, Hossick, Old Bennington, Bennington, Woodford, Searsburg, Wilmington, Marlboro, Brattleboro, Putney, Westminster, Bellow Falls, Charlestown, Claremont, Ascutneyville, Hartland, White River Junction, Hartford, Sharon, Royalton, East Brookfield, Williamstown, Barre, Montpelier.

For the return trip we have planned a route through Canada, and if you follow this apply for a thirty-day touring permit from the Canadian customs collector at the Canadian frontier. The route follows from Montpelier to Middlesex, Waterbury, Richmond, Williston, Burlington, Chazy, N. Y., Coopersville, Rouses Point, Lacolle, Quebec, Napierville, Douglas Corners, Laprairie, Montreal, Lachine, St. Anne Isle Perrot Ferry, Cascades Point, Lancaster, Cornwall, Prescott, Brockville, Gananoque, Kingston, Cataraqui, Napanee, Marysville, Shannonville, Belleville, Trenton, Colborne, Cobourg, Port Hope, Bowmanville, Whitby, Pickering, Toronto, New Toronto, Port Credit, Oakville, Bronte, Burlington, Aldershot, Hamilton, Ancaster, Alberton, Brantford, Burford, Cathcart, Woodstock, Ingersoll, Thamesford, London, Hyde Park, Warwick Village, Kertch, Sarnia, Port Huron, Mich., Thornton, Goodells, Capac, Imlay City, Lapeer, Flint, Owosso, Ovid, St. Johns, Pewamo, Ionia, Grand Rapids, Berlin, Coopersville, Spring Lake, Grand Haven, West Olive, Holland, Saugatuck, Douglas, South Haven, Watervliet, Coloma, Riverside, Benton Harbor, St. Joseph, Stevensville, Bridgman, Sawyer, Three Oaks, New Buffalo, Michigan City, East Gary, Miller, Gary, Calumet, East Chicago, South Chicago, Chicago. If you do not wish to repeat the route from this point, proceed through Elgin, Lake Geneva, Janesville, Madison and Stevens Point to Wausau, and then on to Ashland and Superior.

Vols. 5, 4, 3, 1 and 2 of the Automobile Blue Books, published by the Automobile Blue Book Pub. Co., 910 South Michigan avenue, Chicago, contain complete running directions for the above trip.

Philadelphia, Pa.—Covington, La.

Philadelphia, Pa.—Editor MOTOR AGE—Give a route from here to Covington, La., passing through Gettysburg, Pittsburgh, Columbus, Louisville and Meridian. What is the mileage?—A. T. Prescott.

From Philadelphia proceed to Ardmore, Bryn Mawr, Wayne, Daylesford, Paoli, Whitford, Downingtown, Thorndale, Coatesville, Vintage, Paradise, Soudersburg, Lancaster, Mountsville, Columbia, Wrightsville, Hellam, York, Thomasville, Abbottstown, New Oxford, Gettysburg, McKnightstown, Fayetteville, Chambersburg, St. Thomas, McConnellsburg, Breezewood, Everett, Bedford, Buckstown, Jenners, Ligonier, Greensburg, Adamsburg, East McKeesport, East Pittsburgh, Wilkinsburg, Pittsburgh, Santiago, Florence, Wierton, Steubenville, Wintersville, Hopedale, Cadiz, Moorefield, Piedmont, Londonderry, Antrim, Winterset, Cambridge, Concord, Zanesville, Jacksontown, Newark, Granville, Columbus, West Jefferson, London, South Charleston, Cedarville, Xenia, Waynesville, Lebanon, Mason, Sharon, Cincinnati, Mack, Cleves, Homestead, Lawrenceburg, Aurora, Aberdeen, Vevay, Ohio River Ferry, Carrollton, Ky., New Castle, Eminence, Shelbyville, Eastwood, St. Mathews, Louisville, Shively, Meadowlawn, West Point, Elizabethtown, Upton, Munfordville, Woodsonville, Horse Cave, Cave City, Glasgow Junction, Bowling Green, Auburn, Russellville, Adairville, Springfield, Goodlettsville, Madison, Nashville, Columbia, Mount Pleasant, Rockdale, Lawrenceburg, Loretto, St. Joseph, Tenn., St. Florian, Florence, Sheffield, Tuscumbia, Russellville, Duketon, Hackleburg, Hamilton, Guin, Vernon, Columbus, Miss., Crawford, Brookville, Macon, DeKalb, Daleville, Meridian, Quitman, Shubuta, Heidelberg, Errata, Laurel, Ellisville, Hattiesburg, Clyde, Oloh, Columbia, Pearl River Bridge, Hopewell, Hickman, Sandy Hook Sta., Bogalusa to Covington.

This trip will approximate 1600 miles. Vols. 3, 4 and 6 of the Automobile Blue Books, published by the Automobile Blue Book Pub. Co., 910 South Michigan avenue, contain complete running directions for this trip.

Springfield, Ohio—Fort Dodge, Iowa

Springfield, Ohio—Editor MOTOR AGE—Have planned to go to Fort Dodge through Indianapolis, from there to Chicago Heights over the Dixie Highway, to Clinton, Iowa, Marshalltown, and Ames. Can you suggest a better route?—S. John Moreau.

You will find the Dixie Highway very poor in Illinois. We would suggest the following route: Springfield, Vandalia, Richmond, Indianapolis, Flackville, Royalton, Lebanon, Mechanicsburg, Antioch, Frankfort, Lafayette, Remington, Goodland, Morocco, Schneider, Lowell, Brunswick, Dyer, Frankfort, New Lenox, Joliet, Minooka, Morris, Ottawa, La Salle, Peru, Seatonville, Hollowayville, Princeton, Sheffield, Anawan, Geneseo, Green River, Moline, Davenport, Iowa, Durant, Moscow, Atalissa, West Liberty, Iowa City, Coralville, Oxford, Marengo, Victor, Grinnell, Kellogg, Newton, Colfax, Des Moines, Dallas Center, Dayton, Fort Dodge.

Vols. 4 and 5 of the Automobile Blue Book published by the Automobile Blue Book Pub. Co., 910 South Michigan avenue, Chicago, contain complete running directions for this trip.

Texarkana, Ark.—Carlsbad, N. M.

Texarkana, Ark.—Editor MOTOR AGE—Give me routing from here to Carlsbad, N. M.—W. E. Ralph.

From Texarkana, ride to New Boston, Tex., DeKalb, Annona, Detroit, Blossom, Paris, Brookston, Windom, Bonham, Whitewright, Vandalia, Melissa, McKinney, Dallas, Grand Prairie, Arlington Fort Worth, Weatherford, Mineral Wells, Palo Pinto, Caddo, Breckenridge, Albany, Hamby, Abilene, Roscoe, Hermleigh, Snyder, Gail, Tahoka, Brownfield, Gomez, Plains, Roswell, Artesia to Carlsbad.

Vol. 7 of the Automobile Blue Book published by the Automobile Blue Book Pub. Co., 910 South Michigan avenue, contains complete running directions for this trip.

Tulsa, Okla.—Suffield, Conn.

Bartlesville, Okla.—Editor MOTOR AGE—Give route from Tulsa, Okla., to Suffield, Conn., via Pittsburgh and New York.—R. F. MacArthur.

From Tulsa, the route goes through Collinsville, Sequoyah, Chelsea, Catale, Venita, Miami, Lincolnville, Baxter Springs, Kan., Galena, Joplin, Mo., Diamondville, Pierce City, Verona, Marionville, Billings, Springfield, Galloway, Rogersville, Diggins, Manfield, Macomb, Norwood, Mountain Grove, Cabool, Houston, Licking, Rolla, St. James, Leasburg, Sullivan, Anaconda, St. Louis, Litchfield, Nokomis, Shelbyville, Windsor, Mattoon, Charleston, Grandview, Paris, Ill., Terre Haute, Ind., Rosedale, Rockville, Hollandsburg, Bainbridge, Danville, Indianapolis, Greenfield, Dunreith, Germantown, Richmond, Eaton, O., Dayton, Harshman, Springfield, Columbus, Granville, Newark, Linnville, Zanesville, Cambridge, Washington, Morristown, Bridgeport, Wheeling, W. Va., Washington, Pa., Houston, Bridgeville, Carnegie, Pittsburgh, Sardis, Mamont, Saltsburg, Indiana, Barnesboro, Carrolltown, Altoona, Juniata, Bellwood, Tyrone, Schoenberger, Alexandria, Huntington, Lewiston, Thompsontown, Liverpool, Montgomerys Ferry, Speeceville, Coxetown, Harrisburg, Hummelstown, Palmyra, Lebanon, Avon, Wernersville, Reading, Temple, Kirbyville, Kutztown, Maxatawny, Greinigsyville, Wescoville, Allentown, Bethlehem, Farmesville, Easton, Phillipsburg, N. J., Washington, Annandale, Lebanon, Somerville, Bound Brook, Plainfield, Westfield, Cranford, Elizabeth, Newark, Jersey City, Weehawken, New York, Pelham Manor, New Rochelle, Mamaroneck, Rye, Port Chester, Greenwich, Conn., Stamford, Darien, Norwalk, Southport, Fairfield, Bridgeport, Stratford, Milford, New Haven, North Haven, Tracy, Meriden, Berlin, Hartford, Windsor, to Suffield.

Vols. 7, 5, 4, 3 and 2 of the Automobile Blue Books published by the Automobile Blue Book Pub. Co., 910 South Michigan avenue, Chicago, contain complete running directions for this trip.

Electrical Equipment of the Motor Car

By David Penn Moreton & Darwin S. Hatch.

Editor's Note—Herewith is presented the forty-sixth installment of a weekly series of articles begun in MOTOR AGE *issue of June 29 designed to give the motorist the knowledge necessary to enable him to care for and repair any and all of the electrical features of his car, no matter what make or model it may be. At the conclusion of this series, "Electrical Equipment of the Motor Car," with additions, will be published in book form by the Class Journal Co., Chicago, in a size to fit the pocket conveniently.*

The fundamentals of electrical circuits of the motor car were explained through their analogy to water systems, and the relations of current pressure and resistance were brought out. This was followed by an explanation of series and multiple circuits, how electricity is made to do work in lighting, starting, signalling, etc. Calculating the capacity of a battery for starting and lighting and the cost of charging storage batteries and determining the torque a starting motor must develop were explained. Action of primary batteries and dry cells was considered. A section was devoted to the makeup and action of lead and Edison storage batteries, and another to the care of lead batteries in service and the best methods of charging them. Magnets and electromagnetism then were considered, and the principles of generators and motors explained.

Part XLVI—Classification of Lamps

TWO kinds of material commonly are used in the construction of the filaments for motor car lights, tungsten and carbon, and these filaments are placed in two different kinds of bulbs or globes, one in which the exhausted air is not replaced, and the other in which the exhausted air is replaced with nitrogen gas. The first kind of bulb is called the vacuum bulb, and the second is called a nitrogen bulb.

Tungsten filaments should be used exclusively because of their greater efficiency, as compared with the carbon filament. The extreme tensile strength of the tungsten wire filaments, which is several times that of steel, enables these filaments to withstand without serious injury all the ordinary jar and vibration encountered in service.

The filaments are formed into several quite different shapes, as shown in Fig. 265. The filament shown at A is not suitable for motor car lights, as it is not sufficiently well supported to withstand the extreme amount of vibration to which it would be subjected. The filament shown at B is called the loop back type and is used in lamps that have non-focusing reflectors, such as side and tail lights. The loop is anchored in the middle, which tends to prevent vibration and hence breaking. The filaments shown at C and D are used where high candle power is required and exact focusing of the lamp in the reflector is desired. The filament shown at E is just a straight piece of tungsten wire which is connected to two terminals mounted in the ends of a glass tube. Quite a few other forms of filaments are in use at the present time, but those shown serve to illustrate the general construction. Several complete lamps are shown at A, B and C in Fig. 266.

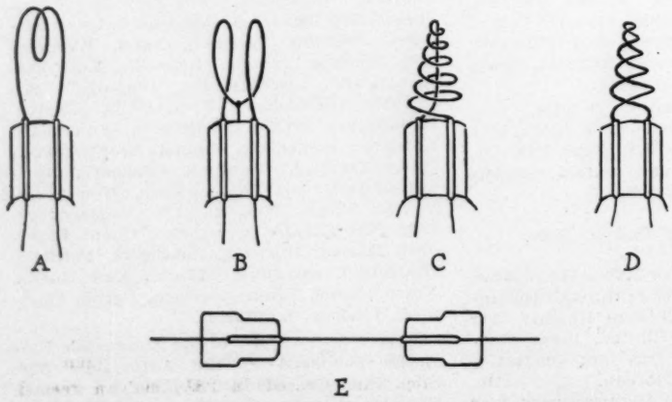


Fig. 265—Different forms of filaments of electric light bulbs

Classification of Lamps by Base

There are four main types of bulb bases, omitting some special types such as those used by the Bosch company, for example. Two of these four main types are of the familiar screw type and are seldom used except in interior body work, while the other two, called the bayonet type, are in quite common use for all purposes. The Edison type base is often called the Ediswan and makes use of a spring-locking device that holds the bulb firmly in place against jarring and consequent loosening. The base for this type is cylindrical and carries two small projecting pins on the side and directly opposite each other. The socket into which the base fits is also cylindrical and of such dimensions as to make a rather loose fit. Two slots are cut along the sides of the socket, and when the bulb base is placed in position, the projecting pins slide into these slots. At the bottom the slots end in a small upturned notch so that the pins in the base will fit into the notches when the bulb is given a part of a turn. In the bottom of the socket are pins that press against the inner end of the base and keep the pins in place in the notches.

One kind of bayonet base is provided with a single electrical contact in the center of the bottom of the base, this contact coming against a spring, or plunger, in the socket when the bulb is in place. The electrical circuit is completed through this contact on one side, while the other side is completed through the metal of the outside cylindrical portion of the base, where it comes in contact with the metal shell of the socket. This type of base is called the single-contact type and was designed primarily for use with the one-wire, or grounded, system of wiring, in which the shell of the socket is attached to the frame of the car and forms part of the electrical circuit through each lamp. A set of single-contact lamps is shown in Fig. 267.

Another kind of bayonet base has two contact points on the bottom of the base, both being insulated from the metal shell and each other. The circuit is completed through these two contacts, and there are two springs, or plungers, in the socket that make connection with the contacts in the base when the lamp is in place. This is called the double-contact type of base and is used with the two-wire,

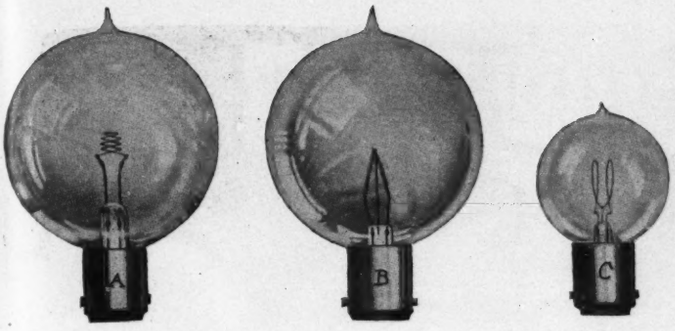


Fig. 266—Examples of filament construction in electric light bulbs

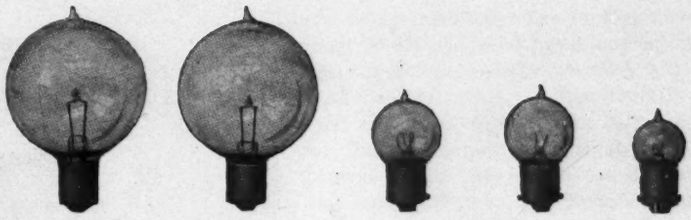


Fig. 267—Typical headlights, side lights and tail light as made by Westinghouse

or insulated return, method of wiring, in which both sides of the circuit are insulated from the frame or metal of the car.

One form of the screw type of base is called the candelabra base, and the other one which is of smaller form is called the miniature base. Their construction is similar to those used on lamps for house lighting, except they are both smaller. A single contact carried in the center of the bottom of the base makes contact with a spring in the center of the bottom of the shell. The other side of the circuit is completed through the shell of the base and a thin shell inside the socket, threads being formed in these two parts so that the lamp will screw into the socket.

The filaments of all the lamps are so designed as to length and diameter that they will take a practically definite current from a certain voltage source of electrical energy. If the lamps be operated at a lower voltage than that for which they are designed, there will not be sufficient current sent through them to heat the filament to the required degree, and as a result the lamp will not burn up to its rated candlepower. On the other hand, if they be operated on a lighter voltage circuit than they are designed for, all excessive current will be sent through the filament, which will result in a lighter degree of heat than the lamp is expected to take care of, and as a result there will be a reduction in the useful life of the lamp, and if the voltage be sufficiently high the lamp may be burnt out almost instantly. The voltage ratings, of course, correspond to the voltages of the circuits on which the lamps are to be operated. The voltage of the circuits in motor car work usually is taken as a sixth more than twice the number of cells in the battery. Thus, a circuit connected to three cells would require 7-volt lamps, one connected to six cels would require 14-volt lamps, etc.

The size of the filament depends upon the current the lamp is to carry, and the length of the filament depends upon the voltage the lamp is to work on. Thus, if the current rating of two lamps is the same, and they are designed for six and twelve coils, respectively, then the filament in the 12-volt lamp will be twice as long as the filament in the 6-volt lamp, etc. If the current ratings were in the same ratio as the voltage ratings, then the filament of the 12-volt lamp would be approximately twice the area and twice as long as the filament of the 6-volt lamp.

The watts required for any lamp are equal to the product of its current in amperes and its voltage in volts. The tungsten filament lamps, depending on the candlepower, require from .95 to 1.25 watts per candlepower, while the carbon filament will require approximately 2.5 watts per candlepower. The following is a list of the lights as used by one of the leading companies:

Lights.	Candlepower	Amperes of Each
Headlights	15	2.5
Side lights	4 or 6	.84 to 1.25
Tail light	2	.42
Speedometer light (when used)	2	.42
Meter light (when used)	2	.42
Dome light (when used)	2 or 4	.42 or .84
Pillar lights (when used)	4	.83

All the above are 7-volt lamps.

Stanley Company Reorganizes

NEWTON, Mass., June 4—The Stanley Motor Carriage Co., this city, undoubtedly the oldest motor car company in the world to manufacture cars in commercial quantities, has been re-organized with increased capital, and immediate steps are to be taken to increase its production of Stanley steam cars. The factory capacity is to be enlarged at once, more manufacturing equipment installed and a strong modern merchandising organization built up. This re-organization does not mean that the Stanley company is going to bring out a cheap steam car, rumors of which have been frequent of late. Such are unfounded. The new organization announces that it will make no change in the models or the price.

Under the reorganization the existing Stanley Motor Carriage Co. has been taken over by the new Delaware corporation, which is of the same name. The new capitalization includes $2,500,000 preferred stock and 100,000 shares common stock of no par value. The financial interests are represented by Counselman & Co., Chicago bankers. The stock will not be offered to the public as financial arrangements have been completed already.

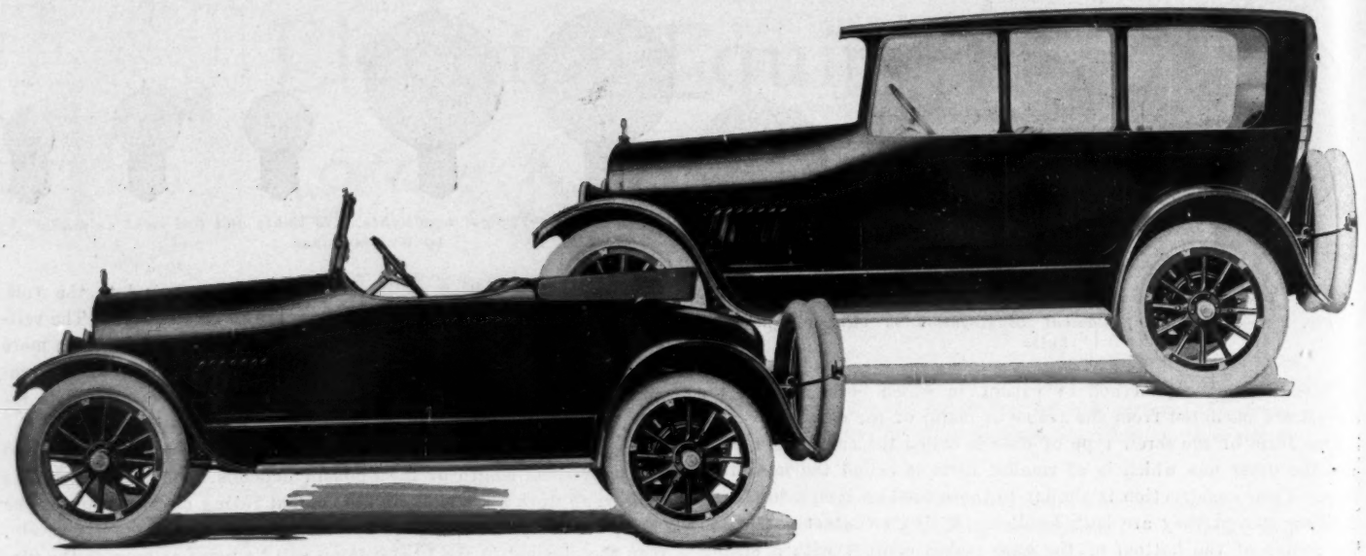
Under the reorganization, Prescott Warren, who has been connected with the organization as vice-president, becomes president. The other officers are: Carleton F. Stanley, vice-president; Frank Jay, Chicago, vice-president; Edward M. Hallett, treasurer; William F. Garcelon, secretary; and the directorate includes the above with Charles Counselman and Arthur L. Goodwillie. Frank Jay has been western representative of the Stanley company for many years, handling the wholesale and retail business of the company from Chicago.

The Stanley company has been one of the picturesque organizations of the motor industry in America. The company has not followed many of the accepted policies of the industry, such as aggressive merchandising, yet the cars have been produced in commercial quantities for almost twenty years. No effort has been made during that time to get into quantity production. The original Stanley Motor Carriage Co. was founded in 1898 and incorporated in 1901 by F. E. and F. O. Stanley. Stanley cars were first built in the plant of the Stanley Dry Plate Co., which continued their manufacture until 1901. The Stanley car was manufactured in quantities in 1898, at which time a production of 200 was put through. The first Stanley cars were built in 1896.

In the early days of the motor car Stanley vehicles were conspicuous in contests. Fifteen years ago the first car to climb Mount Washington in the White mountains was a Stanley driven by F. O. Stanley. The first car to make a mile under 1 min. on an American race track was the Stanley. In 1906 the Stanley figured as a leader in Florida Beach races, when the mile was covered in 28½ sec., a record which stood for six years.

REPUBLIC PERSONNEL CHANGES

Youngstown, Ohio, June 1—Thomas L. Robinson, president of the Republic Rubber Co., has resigned to accept the position of chairman of the board of directors of the company, and Guy E. Norwood, formerly secretary of the B. F. Goodrich Rubber Co., has been elected president to succeed Mr. Robinson. Mr. Norwood will be in charge of operation and sales. John H. Kelly, who for fourteen years has been connected with the Republic Rubber Co. and who for five years has been in charge of sales, has resigned. Charles W. Harding, vice-president of the Republic Rubber Co. of New York, will go to Youngstown to co-operate with Benjamin Swinehart and M. Murray in charge of sales of pneumatic and solid tires.



The four-passenger roadster and seven-passenger sedan on the Westcott 18 chassis

Westcott Features Self-Acting Top

One Chassis Continued with Minor Changes

PRODUCTION began May 1 on the new series 18, Westcott sixes. The line embraces three open type bodies, a four-passenger roadster, and a seven- and five-passenger touring car, the list prices of which will be $1,790. There will also be a Victoria-top model for the seven- and five-passenger touring cars, the list price of which will be $1,940. Closed models will include a seven-passenger and five-passenger Sedan, both selling for $2,390.

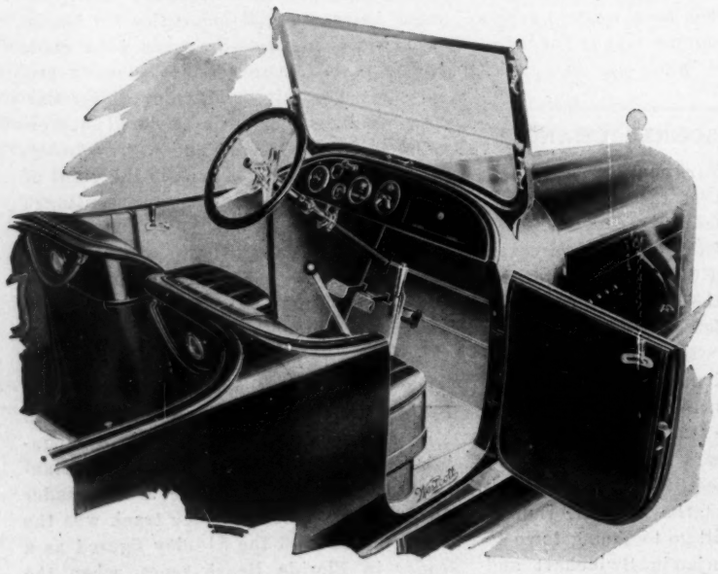
The practice of building one chassis only is continued. The design and construction of this chassis is practically the same as it has been for the last three years. New features on the open cars include a self-acting top. It is said that this top is about the ultimate so far as ease of operation is concerned. A slight push will lower it, and a slight push in turn will raise it.

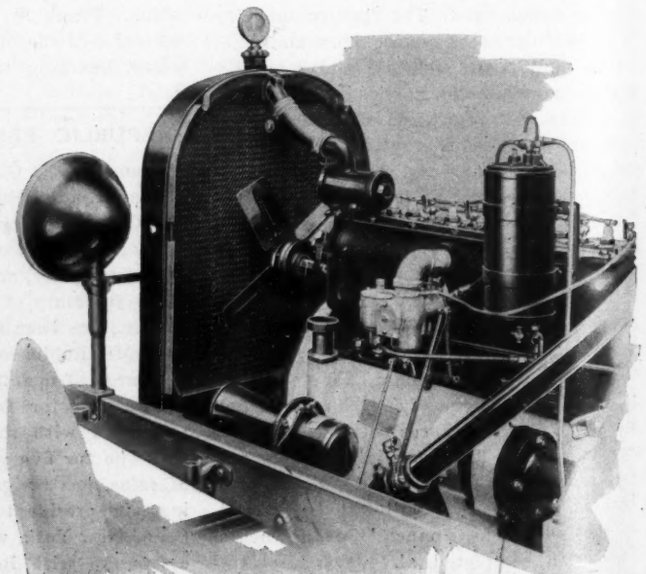
There is now a tool compartment in the left front door. When not in use, this is entirely concealed, but by opening a flap the tools are readily accessible. All open models will be equipped with Jiffy curtains, but in addition will be supplied with Blackmore door openers. These are attachments that permit opening the curtains with the doors without being obliged to release any snaps.

Chassis lubrication throughout is by means of oil cups instead of grease cups, as used heretofore. The position of the gear shifting lever is changed to a more accessible position.

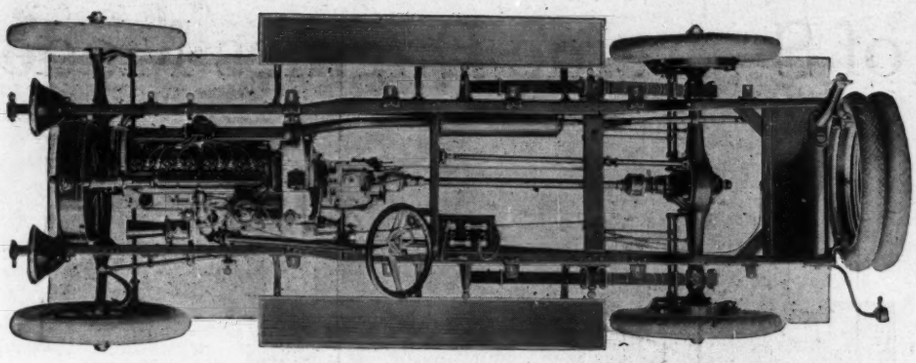
A few changes have been made in the lines of the body. The solid-mahogany cowl board is continued, but the position of the instruments is somewhat changed. The use of a large odds-and-ends compartment in the cowl is continued, and this compartment, together with the instruments, is provided with Yale lock and key. There is a new molding of the bodies. They are swung lower, giving a better road stability and general balance.

For those who are not familiar with the Westcott chassis, it is an assembly made up of standard units. The engine is the large size Continental with the six cylinders block cast and having a bore of 3½ and a stroke of 5¼ in. It has an S. A. E. rating of 29.4 and a dynamometer test of 52 hp. at 1800 r.p.m. Lubrication is a combina-





The cowl board of the Westcott is of new arrangement; also the gearshifting lever is more accessibly located. The view at the right shows the thermostat mounting on the Continental six used in this car



Looking down on Westcott chassis, which is made up of standard units

tion of force feed to the crankshaft and cam bearings with splash to the connecting rods and pistons. Cooling is by centrifugal pump with thermostatic control which regulates the supply of water so as to keep the engine temperature at the point of highest efficiency regardless of atmospheric conditions. The radiator is a Fedders.

A very large multiple-disk dry-plate clutch conducts drive to a conventional three-speed gearset provided with roller bearings at both ends of the main shaft. From this power is transmitted through two Spicer universals and tubular propeller shaft to spiral bevel gears. All torque stresses of driving and braking are absorbed by double tubular torque arms. The front and rear axles are Timken with the same make of bearings and brakes. A Delco two-unit electrical system is provided, and all wiring is metal covered. A mechanical circuit breaker takes care of any possible short circuit, thus eliminating fuse blocks.

Speaking of the new top again, by unclamping it from the windshield the front extension may be folded back and an even tension allows the top to drop back in position in the clamps. When one wishes to raise the top, it is only necessary to remove the dust cover, unfasten the clamps, and the top will swing into place without effort on the part of the operator.

The new cars are produced by the Westcott Motor Car Co., Springfield, Ohio.

NEW STUDEBAKER BRANCHES

Kansas City, Mo., June 2—The Studebaker Corp., chiefly because of extremely rapid increases in retail motor car business in Kansas City territory, has recently taken over some of the retail companies and is now handling the business as branch houses. The Kirkland-Daley Motor Co. had increased the retail sales in Kansas City more than 100 per cent in the last year. H. G. Kirkland of the firm recently bought A. W. Daley's interests in the company and then sold to the Studebaker Corp. June 1 Mr. Kirkland took charge of the retail sales as sales manager at the Kansas City branch.

Expansion of business also was the reason for the corporation's buying the business of the Randeau Motor Co. of Oklahoma City. A factory branch has been established there under Kansas City jurisdiction, with L. R. Ellis in charge. Mr. Ellis has been with the Studebaker company five years, three of these in Oklahoma. The branch will handle retail sales in Oklahoma City and distribution in Oklahoma west of Tulsa. The demands of the supply business were a factor in the establishment of the branch, the Oklahoma territory, with its increasing trade and large number of Studebakers in use, requiring quicker service than could be obtained even from Kansas City. A branch also has been established at Joplin, Mo., in charge of W. H. Watson, where a big supply of parts and cars is carried. One car in fourteen in the Joplin district is said to be a Studebaker.

CONSOLIDATED ABSORBS THOMAS

New York, June 2—The Consolidated Motors Corp., recently organized for the purpose of taking over established concerns engaged in the manufacture of motor trucks, has begun business by acquiring the entire capital stock of the Thomas Auto Truck Co., with headquarters in New York, and the Armored Motor Car Co., also of New York. In addition to the New York plant where Thomas trucks have been and will continue to be built, the Consolidated Motors Corp. has purchased a large steel and concrete plant in Schenectady, N. Y. This plant is being remodeled, and when the alterations are completed it will be one of the most up-to-date factories in the country for the manufacture of motor trucks, bodies and parts. Machinery is now being installed. The factory now has about 75,000 sq. ft. of space and additions and alterations already planned will give 25,000 sq. ft. more. A particularly efficient and patented body will be made here for Thomas trucks exclusively, so that Thomas trucks may go to the dealer and user ready for use. The New York plant, which has been in operation nearly two years, will be retained largely for local business, and will build for and take care of local trade.

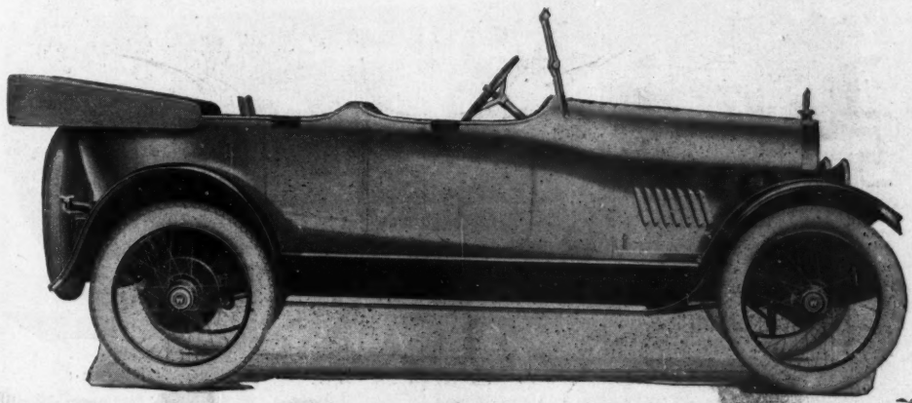
The Armored Motor Car Co., the entire capital stock of which has also been absorbed by the Consolidated Motors Corp., controls various patents on the single and double revolving turret gun cars, a large number of which have been manufactured in Europe by special license and are now doing service on the French and Russian fronts.

The president and general manager of the Consolidated Motors Corp., C. K. Thomas, was president and founder of the Thomas Auto Truck Co., and previously was vice-president and general manager of the Federal Motor Truck Co., of New York. He has been a prominent figure in the truck industry for fifteen years. The company will begin active operations at the Schenectady factory about June 1.

MID-WEST SECTION S.A.E. ELECTS

Chicago, June 2—C. H. Whitney, sales engineer, Willard Storage Battery Co., was elected chairman of the Mid-West Section Society of Automotive Engineers at the regular quarterly meeting of the Section at the Chicago Automobile Club last night. Whitney succeeds F. E. Place of the Buda Co., who automatically becomes vice-chairman. Darwin S. Hatch, editor MOTOR AGE, was re-elected secretary, and George L. Lavery, western manager West Steel Castings Co., was elected treasurer, succeeding Charles W. Stiger, president of the Stromberg Motor Devices Co. As only one ticket was in the field, the elections were unanimous.

Darwin S. Hatch gave a synopsis of the recent editorial conference of the Associated Business Papers with members of the cabinet and the Council of National Defense at Washington.



The seven-passenger Westcott model 18 with wire wheels, which come as extra equipment

Three Types of Supreme Engines Made

Counterbalanced Fours, Sixes and Twelves

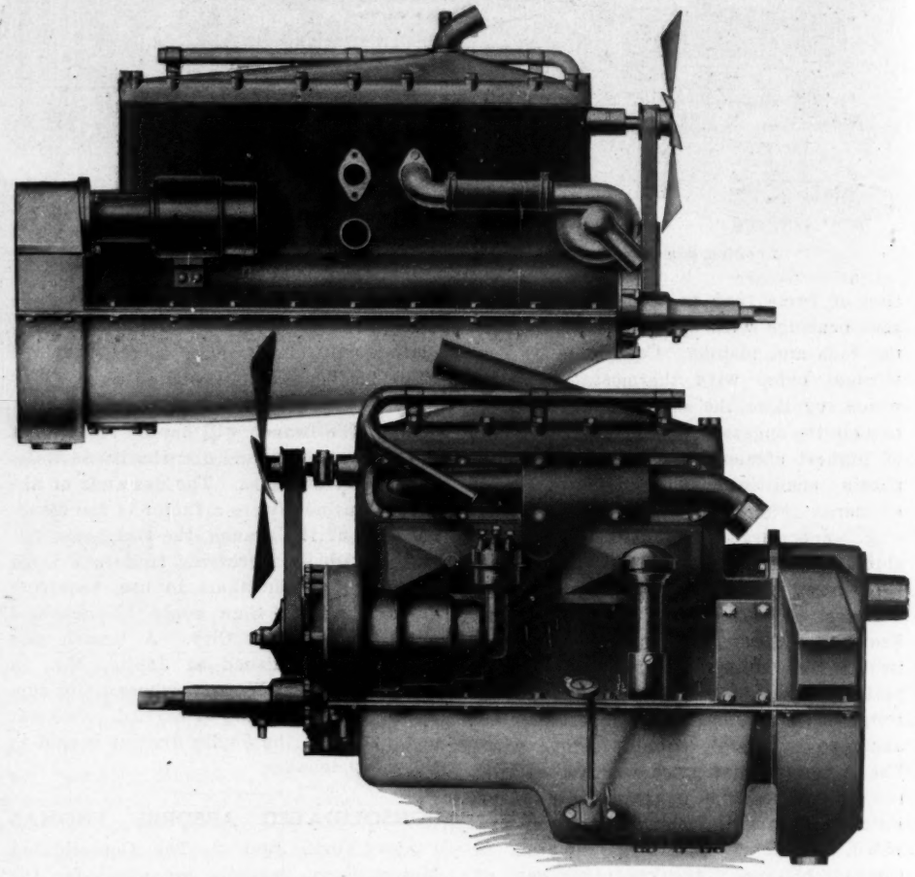
THREE types of engines, a four, a six, and a twelve, are being produced by the Supreme Motors Corp., Cleveland, Ohio. A first glance at all of these engines bears out the fact that they are unusually accessible. Furthermore they seem to embody approved present-day engineering features together with some very interesting refinements.

In the first place all models have counterbalanced multiple-bearing crankshafts. All have a pressure oiling system to all bearings by a gear pump. The pressure is at least 20 lb. at the bearings farthest from the pump when the engine runs at 300 r.p.m. or over. All inlet gases are brought in direct contact with the exhaust manifold through its entire length which vaporizes the heavier fuels satisfactorily. The clear diameter of all valves is equal to at least one-half the bore of the cylinder.

Clearances Are Ample

Another modern feature is found in the construction of the valve spring chambers which are in connection with the crankcase through the breather insuring well lubricated valve stems. Provision has been made for mounting all types of standard accessory units and for mounting the engines in any modern type of chassis. The construction of the engine is such that there are ample clearances with either right- or left-hand drive. There is also provision made for either pump or thermo-syphon system of circulation on both the four and six-cylinder jobs. On the twelve-cylinder, the pump system only is used.

The four-cylinder engine has a 3¼-in. bore, and a 5-in. stroke, and the same dimensions are used in the six. In the four, the counterbalanced crankshaft has three bearings and in the six, four bearings. The oiling system in these engines is entirely inclosed, there being a total lack of outside connections. There is provision made for conducting heated air from the stove on the exhaust manifold directly through a passage between the cylinders to the carbureter without any flexible hose or external connections. The pistons are of the same material as the cylinders, and are fitted with three $\frac{3}{16}$-in. rings. Special oil grooves and drain holes are provided, which in combination with the lower rim acts as an oil wiper.



Carbureter side of the Supreme six above, and exhaust side of the four below

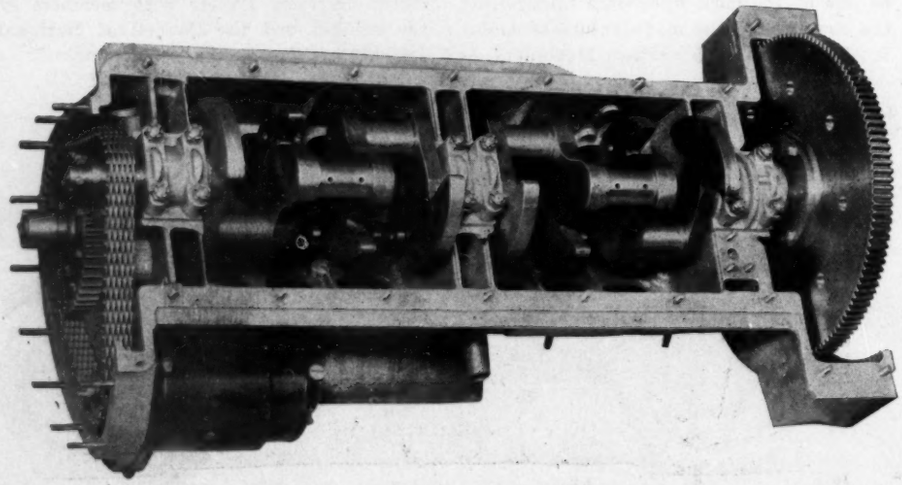
The piston displacement of the six is 249 cu. in., giving an S.A.E. horsepower of 25.4, while on the four, there is a 166 cu. in. displacement with a rated horsepower of 16.9.

The twelve-cylinder engine may be had in two cylinder sizes of 2½ or 2¾ bore, and 5-in. stroke. There is a pressure oiling system to all crankshaft connecting rod, wrist pin, and camshaft bearings, with a triple supply to all timing gears and chains. There are provisions made for mounting a generator starting motor, twelve-cylinder magneto, twelve-cylinder timer, tire pump, and any make of carbureter without any complication, and all units so located as to be very accessible.

Two Cylinder Sizes

There is also provision made for removing all parts including timing gears, chains, camshaft, and crankshaft, without disturbing the three-point mounting which has a trunnion on the front cover at the crankshaft.

The displacement afforded by the two sizes is 295 and 357 in. respectively, giving S.A.E. horsepowers of 30 and 36.3.



The counterbalanced crankshafts of the Supreme four. Note the silent chain camshaft and generator drive

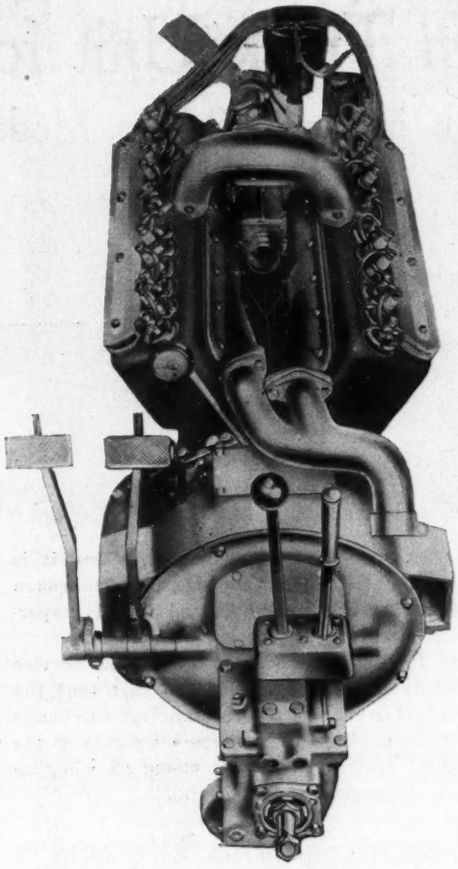
The cylinders are of close-grained gray iron, cast in blocks of six, and set at an angle of 60 deg. with each other. The cylinders and valve passages are completely water jacketed, and the water inlet is situated at the lowest point on the jacketing. The upper half of the crankcase, which is made in unit with the standard bell housing for unit powerplant transmission is cast from aluminum alloy with double-ribbed construction over each bearing for added support.

Force-feed Lubrication

The oil pan is cast from the same material as the crankcase. An oil reservoir having a a capacity of 2 gal. is provided in the lower part of the pan and at the lower point of this reservoir in which the oil filter is located a removable plate is provided which gives access to the filter and also makes it possible to drain and clean the oil reservoir easily.

Lubrication is of the force-feed type with the gear pump drawing oil from the reservoir, forcing it through the hollow camshaft and crankshaft to all main bearings, connecting-rod bearings, camshaft bearings, and through tubes attached to the connecting rods to each wrist pin.

The inlet manifold, which is attached across the top of the cylinders, is water-jacketed on all sides. The carbureter is suspended from underneath the manifold, and just above the V opening between the cylinders. A hot air connection may be run back to the exhaust manifold. As the mixture leaves the carbureter it passes through this water-jacketed manifold, and flows down in through the cylinder manifolds, which are cast integrally with the blocks. These manifolds are thoroughly heated on all sides, there being the water jacket on two sides, and the exhaust gases on the other side, equalizing the heat.



Showing the clean V in the Supreme twelve-cylinder engine

2735 MILES IN TEST

Minneapolis, Minn., June 2—In the non-motor stop run recently undergone by an eight-cylinder stock King car here, a record of 2735 miles in seven days and nights of continuous engine running without mechanical adjustment or repair, except that due to a collision, was made. The car used had 29,550 miles to its credit when it started, as it was the same car used in the test on the Sheepshead Bay speedway last year. The car made 115 round trips between St. Paul and Minneapolis, besides 139.4 miles on other trips. The total number of stops was 105, consuming 14 hrs. and 10 min., though the engine never stopped. The test used 221 gal. of gasoline and 1⅞ gal. of oil. Observers from local newspapers referred the test, which was staged by E. R. Boutell, Inc., distributor.

McQUAY-NORRIS GETS INJUNCTION

St. Louis, Mo., June 2—The McQuay-Norris Mfg. Co., St. Louis, Mo., maker of Leak-Proof piston rings, has been granted an injunction against Albertson & Co., Sioux City, Iowa, with damages by the United States District Court. The decision sustains the copyright of McQuay-Norris covering its book on "Dimensions of Piston Rings," holding that a book of piston ring sizes published by Albertson & Co. is an infringement.

Noteworthy Kerosene Fuel Test

Chicago—Editor Motor Age—We have just completed a long distance test of the kerosene fuel proposition and think it will be well for you to know the results, inasmuch as we think them rather remarkable.

We are using gasoline for warming up the engine and kerosene for all other work. We pay 8 cents a gallon for kerosene, 19 cents a gallon for gasoline and use heavy oil at 34 cents a gallon. All costs are based on these figures.

The driver on this test did not know his fuel consumption in either gallons or dollars but simply used a depth gage on the tanks at each end of every trip. These measurements were changed to gallons here in the office and were finally checked against the Standard Oil Co.'s tickets of fuel delivered.

The truck used was our standard 2½-ton model. This truck had been run a distance of 998 miles in general service before this test was undertaken.

The work done consisted of moving the assembling plant of the Mutual Film Co. from 361 East Ohio street, Chicago, to their new place at Waukegan. The truck was under their observation at all times, and one of their men traveled with it on almost all the trips.

Some of the totals are as follows:

Total distance traveled, 1287 miles.
Number of trips, 16.
Total running time, 106 hr. 55 min.
Average road speed, about 12 m.p.h.
Number of pounds carried, 99,355.
Total fuel cost (kerosene and gasoline), $13.49.
Total oil cost, $1.73.
Total for fuel and oil, $15.22.

Some of the averages are as follows:

Average length of trip, 79.9 miles.
Average running time, 6 hr. 48 min.
Average load carried—Rated load, 5000 lbs.; minimum load, 4680 lbs.; maximum load, 8175 lbs.
Average fuel cost per trip, 84.35 cents.
Average oil cost per trip, 10.8 cents.
Average fuel and oil cost, 95.15 cents.

Ton-mile costs were as follows:

Fuel cost per ton-mile, 0.340 cent.
Oil cost per ton-mile, 0.044 cent.
Fuel and oil cost per ton-mile, 0.384 cent.

We might call your attention to the fact that the above figures show 260 ton-miles per dollar expenditure for fuel and oil while 85 to 95 ton-miles per dollar has been considered very good.—Manly Motor Corp.

REPORT OF KERESONE FUEL TEST COMPLETED BY 2½-TON MANLY TRUCK

Date	Trip	Mileage	Time Hr.	Time Min.	Load Pounds	Cost in Cents: Fuel	Oil	Total	Condition of: Weather	Roads
4/10	1	80	6	50	6000	88.5	10.6	99.1	Cool	Fair
4/11	2	78	6	45	6000	95.0	9.5	104.5	Cold	Fair
4/13	3	81	7	..	4680	94.8	9.8	104.6	Cold	Good
4/14	4	78	6	50	6400	97.2	10.0	107.2	Cold	Good
4/16	5	79	6	30	7400	87.5	11.2	98.8	Cold	Good
4/18	6	79	7	10	5250	85.6	10.9	96.5	Warm	Wet
4/19	7	79	6	35	5850	96.8	9.9	106.7	Rain	Mud
4/20	8	95	8	35	6220	84.2	11.1	95.3	Cold	Mud
4/23	9	79	6	40	5100	75.8	11.8	87.6	Cold	Fair
4/24	10	79	6	30	7000	74.0	12.2	86.2	Cold	Fair
4/25	11	78	6	50	8175	78.4	10.8	89.2	Rain	Mud
4/26	12	78	6	30	7000	71.6	11.6	83.2	Cold	Mud
4/27	13	78	6	30	6975	88.5	11.0	99.5	Cold	Fair
4/28	14	78	6	25	5435	65.2	10.8	76.0	Cold	Fair
4/29	15	79	6	25	5470	82.1	10.4	92.5	Rain	Mud
4/30	16	80	6	50	6400	84.1	11.2	95.3	Rain	Mud

In the total distance traveled there were three delays: Twice to clean the magneto distributer and once to add oil to the transmission.

Dearborn Truck Unit for Any Car

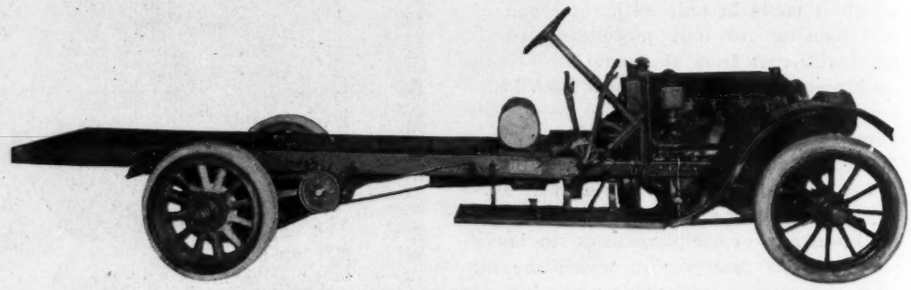
Built in 1 and 2-Ton Models

THE Dearborn Truck Co., Chicago, announces two new truck units adaptable for use with any standard chassis. One has a 1-ton and the other a 2-ton capacity. The new units are similar in construction to the original Dearborn attachments which were designed for the Ford car exclusively.

The new 2-ton Dearborn units can be attached successfully to cars having powerplants of 40 to 50 hp., such as Pierce-Arrow, Packard, Peerless, Lozier, Locomobile, Oldsmobile, the larger models of the Hudson and other cars in this class.

Adaptable to the new 1-ton unit, and even to the 2-ton if desired, are such cars as Overland, Maxwell, Buick, Dodge, Studebaker, Hupmobile, Chandler, etc.

Of course the larger units have heavier frame, wheels, etc., than the 1-ton unit, which is really very similar to the original Ford attachment. Some of the specifications of the 2-ton attachment are as follows: 5-in. channel frame, bed axle, 2½ by 2 in. drop forged and heat treated; 3-in. springs, 48 in. long, with nine leaves; an additional relief spring over the rear axle; heavy truck wheels 34 by 5 in.; solid rubber tires, 34 by 5 in.; 1¼-in. pitch Baldwin roller chains and Baldwin steel sprockets and a loading space for a 10-ft. body.



Two-ton convertible unit made by the Dearborn Truck Co. It is applicable to any standard make, in this case being fitted to an old Apperson

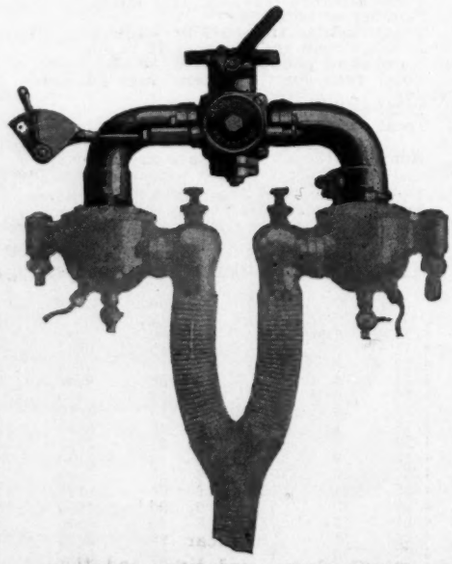
RHAMSTINE KEROSENE ADAPTER

A new type of kerosene carburetion system just put on the market and already adopted by some truck owners is known as the Rhamstine Adapter, and is the product of the Rhamstine Kerosene Adapter Corp., Washington, D. C.

It is used in conjunction with two Schebler carbureters, as shown in the accompanying illustration. One of the carbureters is for starting on gasoline and the other is for running on kerosene. It is claimed that the adapter owes its success to a simple method of atomizing the kerosene. The relative non-volatility of kerosene demonstrated long ago the fact that it is practically impossible to start a cold motor through a cold carbureter on this fuel. Accordingly, a valve was devised which admits of a selective fuel control. In other words, the engine is started on a small quantity of gasoline, which is immediately shut off by the valve when the engine starts to use kerosene with no perceptible change. This valve is controlled from the steering column.

The vaporization of the kerosene seems to be handled in a very practical way. By means of the exhaust the fuel is heated to an average of 135 deg. F. before it enters the standard carbureter. In a like manner the air is heated to an average of 175 deg. F. From the carbureter the mixture passes into the adapter, where it is attenuated, dried and thoroughly broken up. At this period the mixture is vaporized and ready for explosion.

It is claimed that both shop and service tests have brought out the fact that the adapter enables the truck driver to change from gasoline to kerosene by means of the fuel control without a falter showing up in the engine.



The Rhamstine kerosene adapter, which uses two Schebler carbureters, one for kerosene and one for gasoline

BOSCH CONCENTRATES PRODUCTS

New York, June 2—The Bosch Magneto Co., with plants in Springfield, Mass., and Plainfield, N. J., has practically decided to concentrate all its energies on the production of a limited number of standard types of magnetos for the immediate future. The Plainfield plant, which has been devoted to the production of electric lighting and starting apparatus, will be closed.

The change follows the resignation of President Otto Heins and several other executives about a month ago and the subsequent resignation of several factory executives and mechanics. All these men are German subjects with property in Germany and severed their connections with the Bosch company in order not to abrogate their German holdings. Another factor has been the United States Government order forbidding alien enemies to approach nearer than ½-mile to any government munition plant. While the Bosch company has not been producing munitions in the strict sense of the word, the entry of the United States into the war has placed magnetos in the class with munitions because of their wide and general use on government trucks.

Executives of the Bosch company state that the decision to concentrate on a few types of standard model magnetos will not curtail production but will have the opposite effect.

Prior to the entry of the United States into the war, the Bosch company was supplying large quantities of magnetos for truck equipment on vehicles shipped abroad. Shortly thereafter, however, a clause was added to standard contracts forbidding the resale of Bosch equipment to belligerents, and this has somewhat reduced such business. It is believed, however, that this clause will not affect equipment sold to the United States government.

Following the resignation of President Heins, former secretary Carl Schurz was elected to the presidency and now heads the company. Heins has retired temporarily and is spending his time traveling. William De Voe has been elected secretary, and G. Jahn, vice-president and general manager. A. H. D. Altree assumes the duties of sales manager.

PRICE INCREASES

Toledo, Ohio, June 1 — The Milburn Wagon Co. has announced an advance of $100 in its car, effective June 15. The present price is $1,685.

Pontiac, Mich., June 4—The Oakland Motor Car Co. has increased the price of its Sensible-Six $70, beginning June 1, and the car now sells for $945.

From the Woman's Viewpoint

How Stay-at-Homes Can Help Win War

SECRETARY OF THE INTERIOR Franklin K. Lane has sent the following telegram to Mrs. John Dickinson Sherman, chairman of the conservation department of the General Federation of Women's Clubs, in response to a telegram asking in what special line of work the conservation department could render the greatest service in the present national crisis. As the Federation has 9000 clubs, more than 2,000,000 members, and is represented in every state in America and seven foreign countries, some idea of the importance of the work the conservation department of this federation can render in concert is readily apparent.

The women of America, reads the telegram, can do no greater work at this time than to raise their own vegetables, can their own fruit, prevent waste in their homes and give impulse and enthusiasm to the men of the land. If they do this they will be doing a good 50 per cent of the work of fighting the war to a finish. Why not organize all the women's clubs of the United States into a Lend a Hand to Wilson League, whose business it will be to carry on a propaganda for the things the Nation will need—soldiers, ships, wheat, pigs, beans? If the women would also make it their business to let every farmer know that his patriotism is to be judged by the use he makes of his land and let every railroad man know that he is serving his country by moving the Nation's traffic quickly and will herself see that the boys and girls serve in a great maintenance corps of the Nation by putting in their time feeding the chickens, canning surplus fruit and vegetables, they can count themselves among the saviors of liberty and civilization, because this war has now come down to a matter of work and sacrifice. I have just talked with a woman fresh from Belgium. When she left the peasants gathered around her and kissed her skirts in gratitude. Practically all of them have American flags in their homes, which are looked upon as sacred icons by the Belgium peasants. Many of these flags have been made by the women themselves. All Europe must be made to feel that spirit toward America, and this cannot be done unless our women give us the support of their enthusiasm and free for use at the front as large a proportion of our food and labor as is possible by forethought, sacrifice and energy.

The Secretary of War, Newton D. Baker, appealed to the women to help make registration day, June 5, a public festival and patriotic celebration. The women's committee of the Council of National Defense, of which Dr. Anna Shaw is the head, addressed an appeal to the women of the Nation, in which it made public this letter from the Secretary of War, urging the mobilization of the woman power of the country and closing with a new thought that "the accepted wartime tradition is that men must fight and women must weep. In this day and age, however, woman has her definite place and task, which is to be a national woman."

As you know, the Government earnestly desires that June 5, the day of registration, writes Mr. Baker, shall be made a magnificent demonstration of the unity of this country. In the great festivals with which the authorities in every state are preparing to celebrate registration day women should be fully represented. They are giving those they hold among their dearest. Let them show by their active co-operation in this great national undertaking that they give gladly, because in full appreciation of the nobility of the cause.

The Council of National Defense has already asked the state councils of defense to aid in making registration day a great and memorable occasion in our country's history. It is asking the state councils to include women in all preparations. Through your committee I appeal to the women of the country everywhere to join in the celebration of this historic day.

Girls are working on the tractors at the Farmingdale school of the New York State School of Agriculture. As the picture indicates the tractors are working night and day

First of the Season Reaches Chicago Row

CHICAGO welcomed its first woman transcontinental motorist of the season May 25, when Miss Naomi Fontana drew up at the salesroom of the Roamer Motor Car Co. on the row. Miss Fontana was accompanied by her father, Alfredo G. Fontana of Fontana Bros., exporters and importers, New York. The speedometer registered 4250 miles, part of which was made in side trips while they were en route East from San Francisco.

Miss Fontana and her father had planned a trip to Japan, but abandoned it and decided to tour across country instead. They came from San Francisco by Los Angeles and the Santa Fe trail, crossing Arizona, New Mexico and Colorado, striking the Lincoln highway in Nebraska for the rest of the way. The car was equipped with the Goodyear cord tires, and there were only two punctures. According to Miss Fontana, the six averaged 13 miles a gallon of gasoline and the best day's run was 225 miles. The tourists spent two days in the Grand Canyon, three days at Denver and a day at Colorado Springs and Omaha.

The car left the coast May 4, arriving at Chicago in fourteen days' running time, though the trip took twenty days. Road conditions in the West were reported as bad for this time of year.

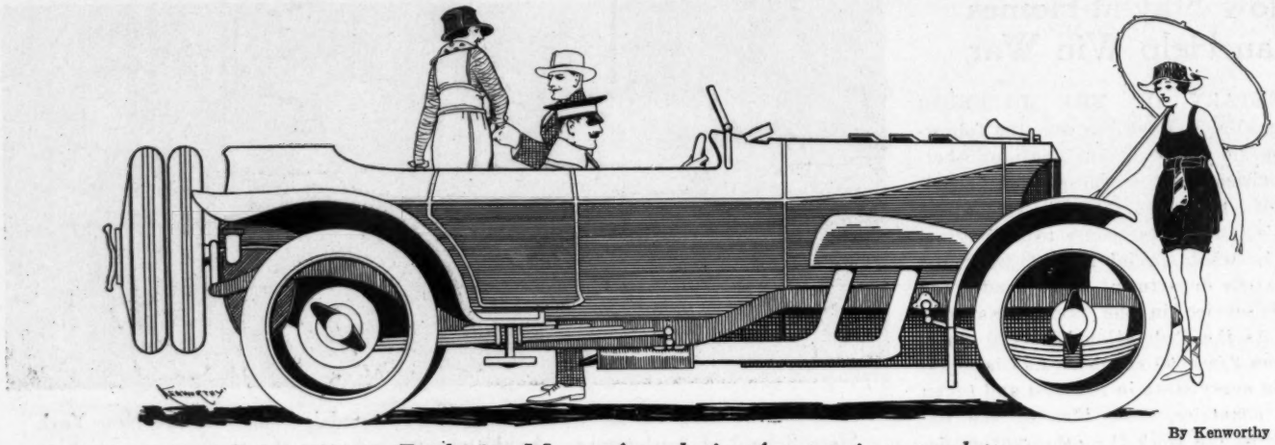
Sense and Comfort Are Synonymous

THAT sense and comfort are synonymous was proved again at the pageant given on the sand dunes of Indiana in the interests of a National Park Decoration Day and last Sunday. The women who came prepared to climb sand hills and walk sand paths in shoes that would give and yield to a certain extent, were much more comfortable than those who dressed as if for a country picnic that comes but once a year. A downpour was an added witness to their sense.

Many of the women who attended the pageant came by motor car, for good roads lead to the park. They wore outing clothes in nearly every instance. Most of them had on heavy walking shoes, and while the bright colors of the summer sports coat were in evidence, none of the color was that of an unserviceable garment.

Many of the women are rejoicing that they have had their day of khaki clothes, especially now that they may not wear any more. The Chicago bus men had to stop wearing their khaki-colored suits after the declaration of war, and artists who are accustomed to wander about the country in khaki during vacations have been warned to have their suits dyed some other color.

The Readers' Clearing House



By Kenworthy

Exclusive MOTOR AGE *design for touring speedster*

OILING SYSTEM FOR FORD SPEEDER

Can Enlarge Valves ⅛-in. in Diameter Safely

NEW LEBANON, Ohio—Editor MOTOR AGE —I want advice as to an oiling system for a Ford speedster with which I hope to make about 70 m.p.h. I want to use a hand pump with it.

2—How large valves can you use in a Ford? —C. C. M.

When the usual Ford oiling system is used for high speed purposes, trouble is usually encountered, due to the fact that the oil does not flow down the oil tube which is placed inside the crankcase. Ordinarily the oil is splashed up by the flywheel and a certain amount of it caught in the funnel-shaped end of the oil tube which carries it to the timing gears. From here the oil flows to the connecting-rod troughs and back to the flywheel housing. At extreme high speeds the oil does not get to the timing gears properly by means of the oil tube and some positive means must be employed to make sure that the oil is getting to all parts of the engine.

A suggested oiling system is shown in Fig. 1 and consists of a reservoir placed at any convenient point on the chassis and from which the oil can be pumped to the crankcase by a hand pressure pump. From the crankcase the oil is pumped by a small piston pump, as shown, to a gage on the dash and then to the timing gears. To place the pump on the engine a hole is drilled in the side of the crankcase directly opposite number four exhaust cam, and of sufficient size to allow the head A of the piston to pass through it. The pump parts are made of brass and consist of the tube B screwed into the flange C, the latter being provided with four holes for cap screws which hold the pump in place. The holes for these cap screws in the crankcase are tapped and a leather gasket placed as shown. The pump piston can be made of steel and is actuated at one end by a coil spring, and the exhaust cam on the other. A bushing D is fitted into B to which the remaining part of the pump is screwed. This part carries the check valves and the manner in which they should be placed is clearly shown in the illustration.

Copper tubing of ¼-in. diameter is used for the leads and the connections made in the usual manner, using the solderless type of connections. One lead goes from the oil tank to the hand pump and a second pipe from the pump to a hole E in the crankcase. At F the usual Ford pet cock should be removed and a fitting screwed in its place so that a lead can be carried to the lower opening of the engine oil pump. This lead is shown at G. The remaining opening at the top of the engine pump is connected to the upper connection on the gage, and finally a pipe is run from the remaining gage connection to the timing gear case top. A hole must be drilled for this and tapped to fit the type of connector used.

2—You can fit valves about ⅛ in. larger

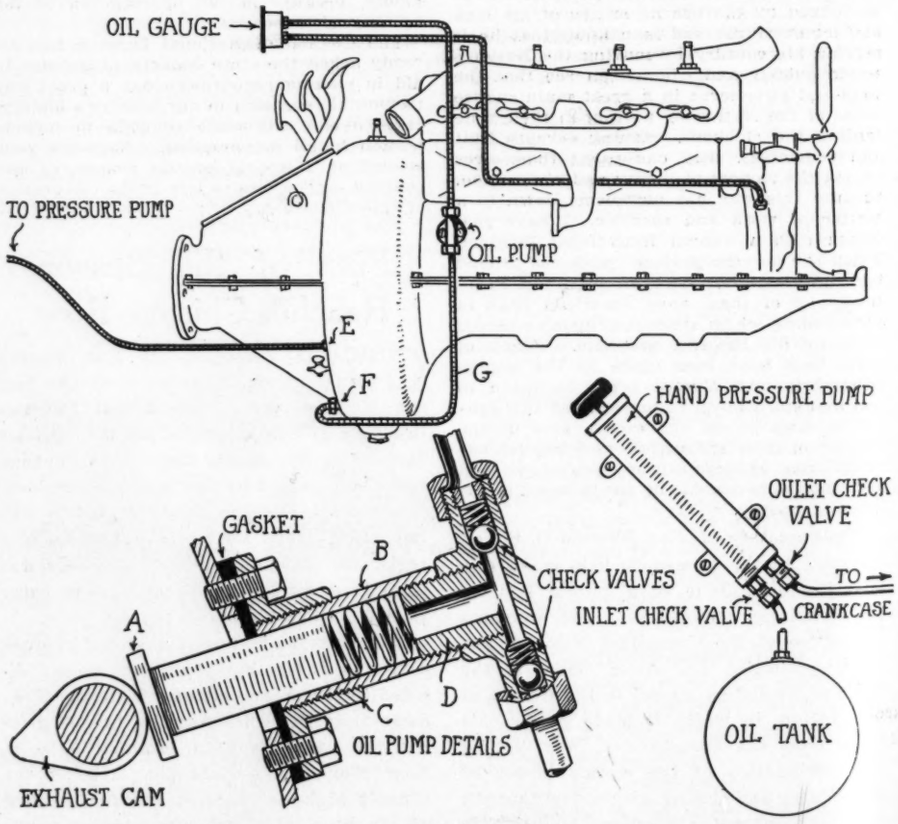


Fig. 1—Oiling system as auxiliary unit for Ford engine. Such a system is necessary for high-speed work

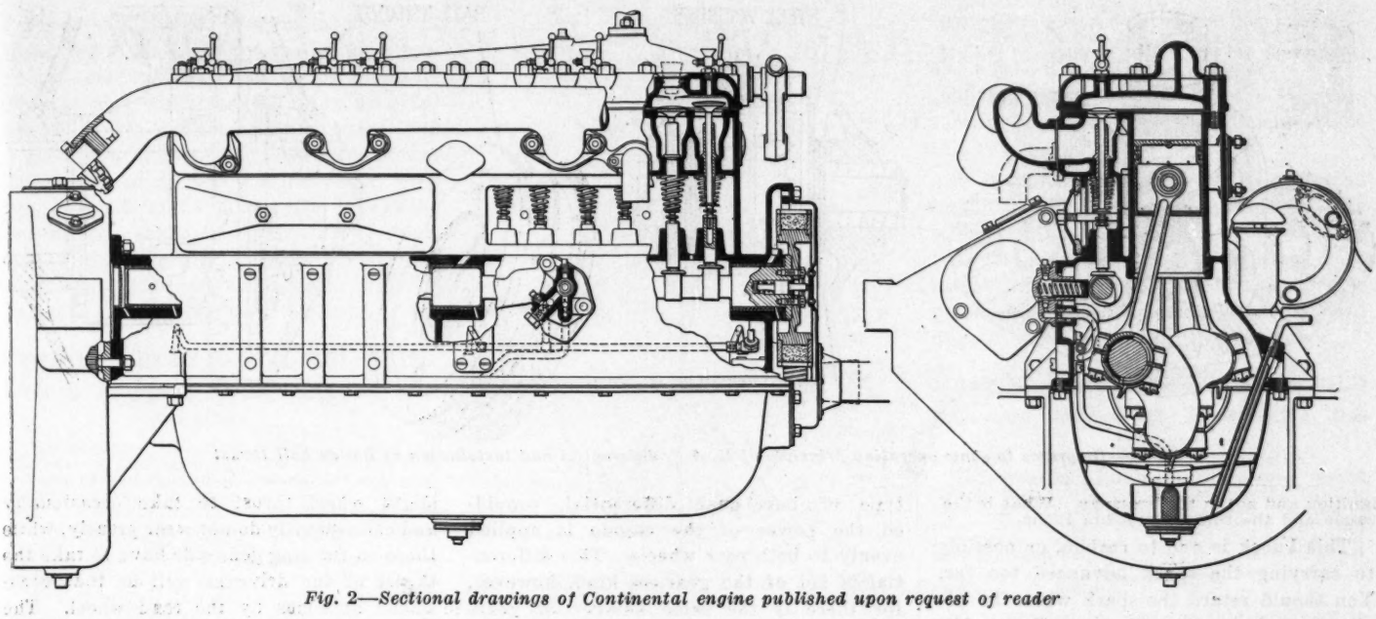


Fig. 2—Sectional drawings of Continental engine published upon request of reader

in diameter than the present ones and be on the safe side.

CANNOT COUNTERBALANCE A FORD

No Satisfactory Method of Rebuilding Crankshaft

Hampton, Iowa—Editor MOTOR AGE—We wish the following information in regard to rebuilding a Ford:

1—Would Ford high-speed clutch be suitable to use with a three-speed selective gearset?

2—Can you give method of counterbalancing a Ford crankshaft, which can be done in an ordinary machine shop?

3—Is it advisable to remove magnets and replace with non-magnetic material?

4—How much do magnets retard speed and power of motor?—Sikkema Auto Co.

1—It could be used by building a special gearset throughout to fit it, but the expense would be so much that such alteration would be inadvisable.

2—There is no satisfactory way of counterbalancing a Ford crankshaft.

3—If you have some other form of ignition, yes.

4—To our knowledge it has never been estimated. However, it is enough to pay to remove the magnets if there is another means of igniting.

ELMORE TWO-CYCLE ENGINE MISSES

Front Two Cylinders Will Not Fire Properly

Alice, Tex.—Editor MOTOR AGE—We are having some trouble with an Elmore two-cycle engine. Have just installed new rings and rotary valves. It is in good condition, but we cannot make the two front cylinders fire, although the two rear cylinders work perfectly. Ignition is by Atwater Kent and K. W. high tension magneto and seems to be all right. The engine has a two-way gas intake manifold. It doesn't seem to get an explosive mixture to the front cylinders. How can the trouble be remedied?—Lynn Bros. Garage.

If you are sure that all the adjustments such as ignition, carburetion, etc., are correct, and that the two front cylinders have good compression, there is a possibility that the pistons in these cylinders were turned around in assembling the engine so that the baffle plates on top of the pistons are opposite the exhaust ports, whereas they should be opposite the intake ports. This would allow the incoming charge of gas to rush across the top of the pistons and out of the exhaust ports. The function of the baffle plates on the pistons is to deflect the incoming charge of gas to the top of the cylinder, where it is compressed, fired, and the burnt charge expelled through the exhaust ports uncovered by the pistons when the latter reach the bottom of their stroke. The proper placement of the piston in the cylinder as regards the baffle plate is shown in Fig. 3. The fact that the two rear cylinders fire properly would indicate that the rotary valve sleeve has been put in properly. We would also suggest that you look carefully for leaks in the crankcase and where the intake manifold connects to the engine. It would also be advisable to go over the ignition system again and see that the cables leading to the front plugs are connected properly so that the firing order is correct. Also test for a spark at these cables and plugs, to make sure that the ignition system is in order.

Intermittent Firing on Ford

Drumright, Okla.—Editor MOTOR AGE—What is the cause of intermittent misfiring in a Ford engine? The engine runs perfectly while idling and when speeded up to about 15 m.p.h. I have tried two sets of plugs of different make, new coils, coil boxes, wirings, commutators, carbureters, gaskets and cleaned out all parts. The timing of the engine is correct. When throttled down to where missing begins, by pressing the foot on the pedal and speeding the engine to labor it will begin firing regularly again. When throttled down lower to where it ought to idle reasonably, it stops completely as though the switch were off.—Bob Brown.

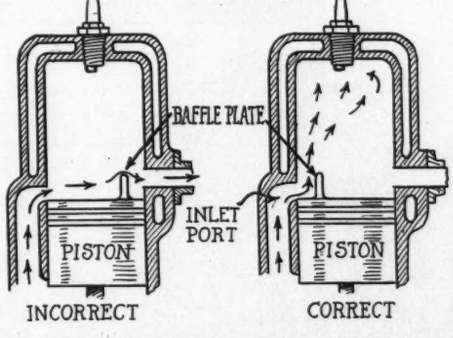


Fig. 3—Probable reason for miss in Elmore two-cycle engine. If the pistons are reversed the engine will not fire correctly

It would appear that the magneto magnets are weak. The remedy is to install new magnets or have the present ones recharged.

GREASE EXITS AROUND WHEELS

Unusual Trouble in Maxwell Lubricating System

Winchester, Ill.—Editor MOTOR AGE—Why does grease persist in working out around the left rear brake drum on my 1916 model 22 Maxwell? I have cleaned it and have proper amount of grease in differential.

2—Is there any way a 6-volt battery could be used instead of a 12-volt?

3—Will the life of my tires, 30 by 3½, be materially shortened if I drop the pressure down to 55 lbs.?—C. M. Smithson.

1—This case is very rare and in practically every case where reported has been traced to the use of too much oil or grease in the differential, or too much grease in the hub cap. The rear-wheel bearing is lubricated from the grease which is placed in the hub cap, and if the cap is removed, filled with grease and screwed back on too frequently there is danger of forcing the grease out around the brake drum. It is barely possible that the rear wheel felt washer needs renewing, although we believe the trouble is entirely due to too much grease, either in the wheel or in the differential.

2—No.

3—Yes. You should keep the pressure up to the recommended figure.

Working Parts of Engine

Forest, Ind.—Editor MOTOR AGE—Give diagram of working parts of 7 W. Continental motor.—Pearl Knight.

Side and front cut-away views of this engines are shown in Fig. 2.

Hupp Has Carbon Knock

Dilly, Wis.—Editor MOTOR AGE—My Hupmobile Series N. is equipped with the Atwater Kent system. In going up a grade when the engine starts to labor there is a sort of metallic knock which increases in volume with the speed. It seems to be in the

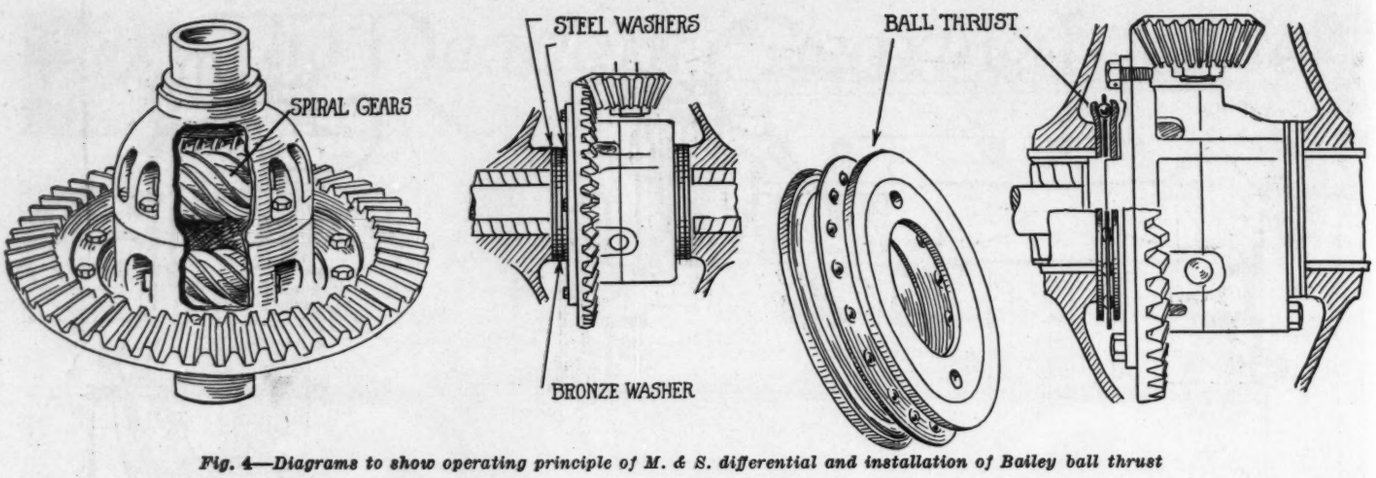


Fig. 4—Diagrams to show operating principle of M. & S. differential and installation of Bailey ball thrust

ignition and not in the bearings. What is the cause and the remedy?—Albin Picha.

This knock is due to carbon, or possibly to carrying the spark advanced too far. You should retard the spark when the engine is pulling slowly in ascending a hill and, furthermore, you should shift gears before the engine starts to labor if you wish to preserve your car as long as possible. It would be well, however, if the knock is pronounced, to have the carbon cleaned out without delay.

SOMETHING ABOUT PISTON STOCK

Action of Aluminum Alloy and Advantages of Use

Detroit, Mich.—Editor MOTOR AGE—What lightweight piston can be fitted as snug as cast iron? I have tried the so-called Maganalite and they have to be too loose for ordinary work, but for speed it is different, as I could run along 35 m.p.h. and better with the light pistons than 23 m.p.h with the original iron ones, but with slow driving they pumped oil and lost compression.

2—Does the M. & S. gearless differential save power?

3—What size balls and retainers are used in Ford rear axles to relieve side friction?

4—What carbureter is best for general use for Ford cars, for speed up to 60 m.p.h.?—F. LeDixon.

1—Aluminum-alloy pistons are never fitted as tight as the cast-iron pistons. The usual clearance in a cast-iron piston of the average motor car engine is about .002 or .003 in., while an aluminum-alloy piston of the same diameter would probably have a clearance anywhere from .004 to .005 in. The expansion of the cast-iron pistons is not so great as that of the alloy pistons and can therefore be fitted much more closely than the latter. Where speed is the important factor, the "sloppy" fit of the alloy pistons can in most cases be ignored, because when the engine starts to get hot the clearance between the pistons and cylinder walls will be diminished. The manufacturers of aluminum-alloy pistons claim greater reciprocating motion, quicker accelerating, and among other things less vibration with these pistons. Very good results have been obtained by fitting lightweight gray iron pistons in engines where speed conditions are normal. These particular pistons can be fitted quite snugly in the cylinders.

2—According to the maker, this differential will pull a greater load than the usual type of bevel-gear differential, provided the power of the engine is applied evenly to both rear wheels. This differential is not of the gearless kind, however, for there is the same number of gears found in it as in the ordinary bevel gear type. The difference is in the gears. In the ordinary type there is a bevel gear attached to the inner end of each axle shaft which meshes with three or four smaller pinions carried on a spider. In the M. & S. spiral gear differential the gears which fasten to the axle shafts are of the spiral type cut on an angle of 45 deg. These gears mesh with four other spiral gears which correspond to the four bevel gears in the spider differential. They are placed as shown in Fig. 4.

3—There is no ball thrust on the Ford rear axle to relieve the side pressure. The only provision made to take the thrust is the placing of three large washers back of the ring gear on the left side and also on the right side of the differential housing. When in position the bronze washers are between the two steel washers, as shown in Fig. 4. The washers on the right side of the differential housing have only a slight wheel thrust to take occasionally and consequently do not wear greatly, while those on the ring gear side have to take the thrust of the drive as well as that occasioned at times by the road wheel. The result is that these washers need replacing frequently to insure a proper action of the drive pinion and ring gear. When the washers wear thin the ring gear slips away from the drive pinion and the drive is taken on the weakest part of the teeth of each gear. The result is that the teeth are often stripped, unless the washers are replaced. A loud humming noise in the rear axle housing is usually caused by improper meshing of the drive pinion and ring gear. The Bailey ball thrust is designed to replace the flat washers on the left side of the Ford differential, and accompanying illustration shows how it is installed. It is made of heat-treated steel and has eighteen ¼ in. steel balls held in a retainer. According to the maker of this device, it has a capacity of six times the maximum thrust, due to the fact that the large diameter is made necessary in order to get proper clearance, as the illustration will show.

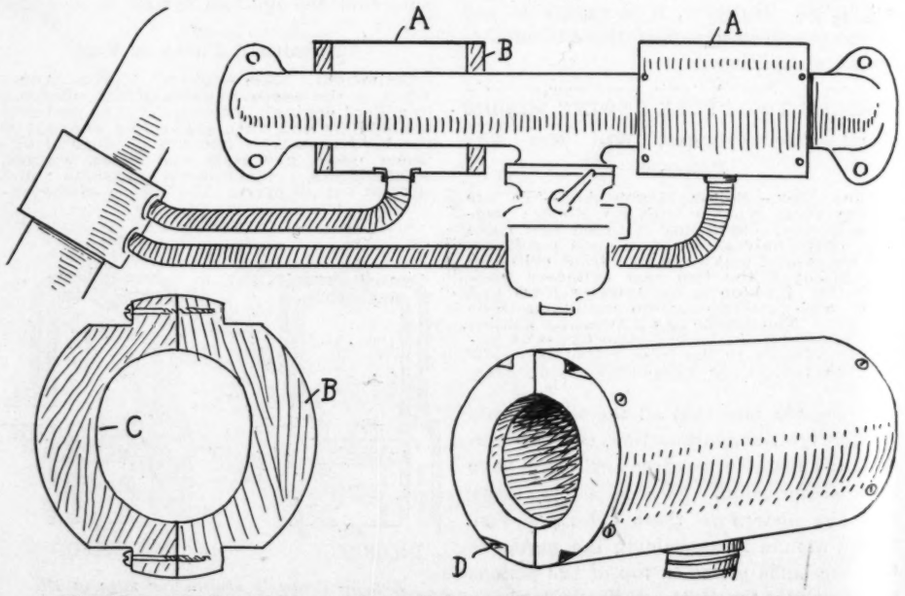


Fig. 5—Installation which may be applied to carburetion system of old Packard to take care of present low-grade gasoline

4—Any of the modern carbureters will give good results with the Ford engine, providing the installation is properly made. This applies when the engine is used for general work, but for speed purposes it is a good plan to fit a little larger carbureter. The latter alone will not, however, give you a speed of 60 m.p.h., for it will be necessary to change the gear ratio to about 3 to 1, put in slightly larger valves, and alter the engine in various other ways as demanded by the increase in speed.

TIMING DIAGRAM FOR VELIE 1915

Method of Resetting Ignition on This Model

Blandinsville, Ill.—Editor MOTOR AGE—Give diagram of timing, or way to reset timing on a Velie 1915 model, large six with a Continental engine and automatic Atwater-Kent system. Illustrate markings on flywheel. The points have been dressed off several times, which I think has affected the ignition, causing the engine to heat, as all other working parts of motor are O. K.—T. V. Argenbright.

A diagram of the valve timing and with the marking on the flywheel, with which you can take the timing of the camshaft and valves is shown in Fig. 6.

In resetting the ignition, if this is thought to be the difficulty, set the engine with No. 1 cylinder at upper dead center and with the distributer arm on contact No. 1 of the Atwater Kent system. Then loosen the short rod which is attached to the Atwater Kent arm and revolve the head slowly until the breaker clicks, and without moving the hood attach the rod to the arm and adjust the lock nuts to hold it in its position. Individual engines sometimes require a little different adjustment, but this can be determined only by trial. If the engine pounds on a hard pull retard the spark a little. On the other hand, if it seems a little sluggish you can advance the ignition from this point to a point where it will not pound while pulling.

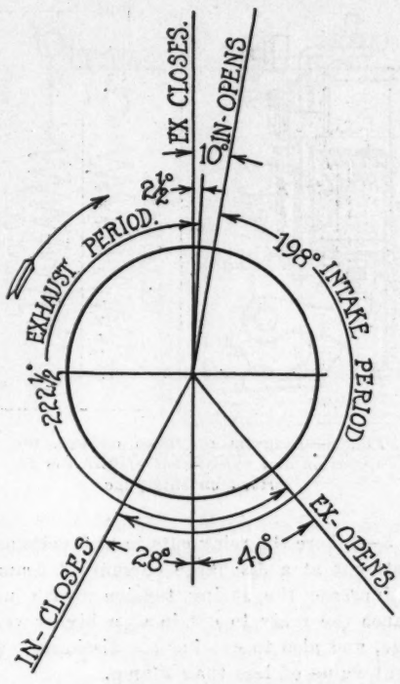


Fig. 6—Diagram to assist in timing of 1915 Velie

Genemotor Not for Buick

Poteau, Okla.—Editor MOTOR AGE—Advise best way of connecting a Genemotor to a Buick, model 29 car.

2—Is it advisable to cut teeth in flywheel and use shifting pinion to start on, then use silent chain drive to generate—and about what ratio in both instances?—Ben Curtis.

The makers of this system have never made such an installation and advise that it would be a rather difficult case of fitting.

It would be necessary to construct new brackets and use different sprockets and chain in order to procure the proper drive ratio of the Genemotor.

2—We do not know of any way in which the Genemotor could be attached so that the pull would be exerted on the flywheel direct, i. e., the cutting of teeth in the flywheel.

Ammeter on Little Six

Clinton, Wis.—Editor MOTOR AGE—Show how an ammeter can be attached to show the generator output and battery charge and discharge on the Little six, 1913, made by the Little Motor Car Co., Flint, Mich. It has a Dyneto generator with no starting motor.

2—Can an ammeter be attached to a Jeffery 462 in addition to its present equipment, and how?—William A. Mayhew, Jr.

1—Published in Fig. 7 is a diagram showing how to connect an ammeter to this system.

2—A 30-030 ammeter can be attached to the model 462 by simply removing one wire from the present gage and running it to one connection on the ammeter, then insert a wire between the remaining connection and the connection on the present gage from which the wire was removed.

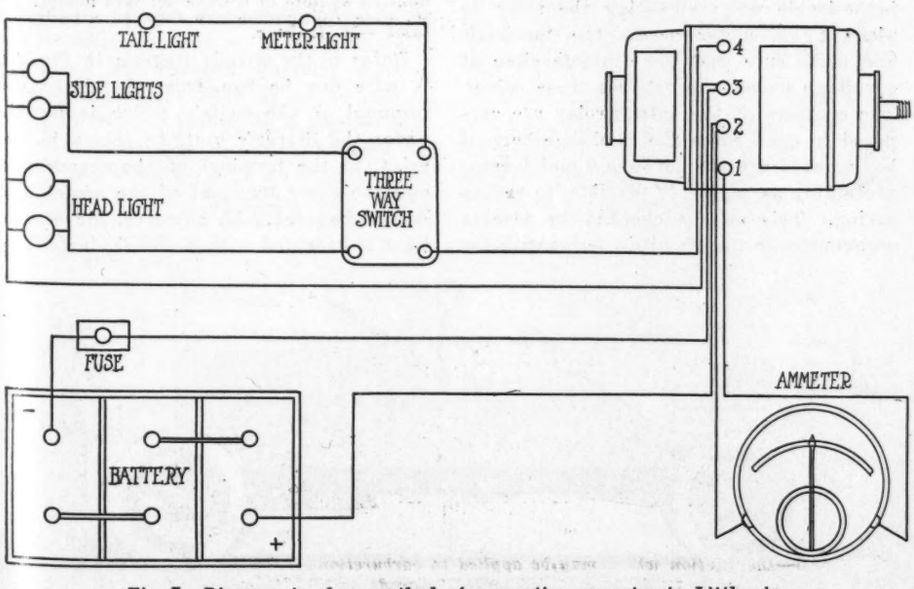


Fig. 7—Diagram to show method of connecting ammeter to Little six

HEATING OLD PACKARD MANIFOLD

Suggested Method of Modernizing Gas System

Belleville, Ill.—Editor MOTOR AGE—I would like to install some means of heating the intake manifold on a 1912 Packard. Would it be practicable and effective to wind soft copper tubing about the manifold which was connected to the exhaust, for the purpose of heating the manifold and the incoming charge of gas?—C. P. Hamill.

A suggested scheme for this is shown in Fig. 5 and consists of two cylinders of sheet metal A fastened to suitable shaped end pieces B made of wood. The latter are made as shown and held together by round headed screws after they have been slipped on the manifold. The opening C in these pieces should be cut a little scant so that the screws will draw the two pieces tightly together and hold them quite firmly upon the manifold. After the four end pieces are in place the metal cylinders A can be slipped in place and fastened to the wood pieces by small screws. A hole is made in the bottom of each cylinder before they are put in place and flexible metal tubing attached to them. This tubing can be about 1 in. in diameter and is the same kind used ordinarily for supplying hot air to the air intake of the carbureter. The other ends of the tubing are attached to hot air stoves clamped around the exhaust pipe. To make a neat looking job the whole device can be painted black, using an engine enamel. The small openings D caused by notching out the wood pieces can be stuffed with asbestos yarn to make them tight.

OPERATION OF CUTOUT ON DELCO

Cadillac System Explained—Remedies for Troubles

Centerville, S. D.—Editor MOTOR AGE—What is the cause and cure for an automatic cutout sticking and not working properly on a 1914 model Cadillac? The cutout sticks and when the car is stopped the generator runs backwards and runs down the battery.—Orrin Raddock.

The trouble is in the adjustment and general condition of the cutout. We will give a complete description, together with methods of adjusting, so that you can give the device a general overhauling. Refer to Fig. 8.

The cutout relay consists of a set of contacts that are held open by spring tension, and closed by an electro-magnet which overcomes the tension of the spring. They should be open when the engine is at rest. The electro-magnet has a compound winding consisting of a voltage coil of many

turns of fine wire, which is connected across the generator terminals, and a current coil of a few turns of coarse wire, which is connected in series between the circuit of the generator and battery, and is energized only when the cutout relay contacts are closed.

When the engine is started, the generator voltage builds up, and when it reaches a value of between 6½ and 7¾ volts, the current passes through the voltage winding and produces enough magnetism to overcome the tension of the spring B, attracting the armature C to the core D, which closes the contacts A. These contacts close the circuit between the generator and storage battery. The current now flows through the current coil, producing magnetism in the core in the same direction as that produced by the voltage coil, thus strengthening the pull on the armature, and holding the contacts closed.

Direction of Flow

When the generator slows down, and its voltage drops below that of the storage battery, current flows from the battery to the generator in the reverse direction through the current coil. The direction of the flow of current through the voltage coil, of course, remains unchanged. The magnetism produced by the current coil now opposes that produced by the voltage coil, so that the resultant magnetism is not sufficient to hold the armature closed against the tension of the spring. This causes the contacts to open, thus preventing any continued discharge of current from battery to generator. The relay should cut out when the discharge current reaches a value of between 0 and 1 amp.

In order to adjust a relay to cutout at the proper discharge current value, two things must be kept in mind. The tension on the spring, and the air gap between the armature and core.

The air gap has little or no effect upon the point of cutout, whereas the spring tension governs this almost entirely. On the other hand, the point of cutting in is governed by both air gap and spring tension.

To illustrate the foregoing, four cases will be assumed:

1—Where the relay cuts in at 8 volts and cuts out when the discharge current is 2 amp.

To adjust the relay, decrease the air gap, as this will cause the cut-in point to occur at a voltage lower than 8 volts, also increasing the discharge current at the moment the relay cuts out. It will be necessary to increase the spring tension slightly in order to cause the relay to cutout before the discharge current exceeds 1 amp.

2—Where the relay cuts in at 8 volts, and cuts out with a charging current of one ampere.

Decrease the spring tension, as this will cause the relay to cut in at a lower voltage and also to cut out after the current starts to discharge through the relay.

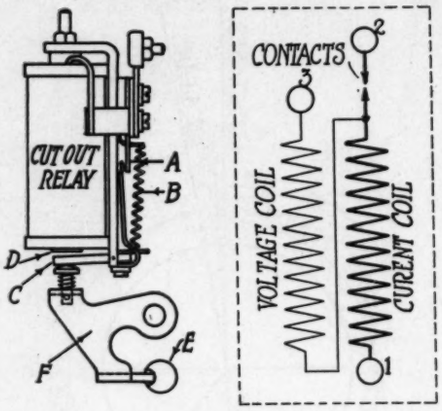


Fig. 8—Diagram of Delco cut-out, the operation and adjustment of which is described on this page

3—Where the relay cuts in at 6 volts and cuts out at a discharge current of 2 amp.

Increase the spring tension which will cause the relay to cut in at a higher voltage, and also to cut in at a discharge current value of less than 2 amp.

4—Where the relay cuts in at 6 volts and cuts out with a charging current of 1 amp. passing through it.

Increase the air gap slightly and also increase the spring tension so as to cause the relay to cut in at a higher voltage and also cut out at a discharge current value of between 0 and 1 amp.

Therefore, the relay adjustment should first be checked for point of cutout and cut-in. Then bearing in mind, whether or not it is desired to correct the point of cutout at the same time, the air gap or spring tension should be changed until the relay cuts in properly. As a last precaution, the contacts should be inspected to make sure that they touch at the same time, and all the way across.

The cutout relay is supposed to close when the voltage across the terminals of the voltage coil is between 6½ to 7¾ volts. Therefore, to check this voltage, it is desirable when adjusting the relay to place a volt-meter across the terminals and make sure that the contacts close at a voltage somewhere between these values. The contacts of the cutout relay are supposed to open when the discharge current has reached a value between 0 and 1 amp., preferably as near 0 as possible, to reduce arcing. This can be checked by placing an ammeter in the circuit in series with the current coil of the cutout relay and seeing what the value of the current is when the cutout relay opens. When properly adjusted, the air gap should be approximately a thirty-second of an inch when the contacts are closed by lightly pressing armature with the finger.

When the relay contacts are burned or pitted, it is necessary to smooth them off. This should be done with a strip of Emery cloth, by placing the strip between the contacts, holding them lightly closed by hand, and then drawing the strip of Emery back and forth.

If the contacts are too badly burned, to enable them to be successfully fitted in this way, it will be necessary to replace them.

After the relay has been reassembled with the new contacts, it should be adjusted in accordance with the instructions given previously.

When the contacts are correctly adjusted, both pairs will make contact at the same instant, and clear across the line of contact, so that when the relay is held up to the light, it is impossible to see light passing through any portion of the line of contact.

It is also desirable when adjusting relays to make sure that all the bushings are in good condition, and that the connections and coil terminals are free from grounds or breaks, as these would cause some uncertainty in the operation of the relay.

Two-Passenger Marmon Body

Muskogee, Okla.—Editor MOTOR AGE—Publish a design of a snappy two-passenger body for a Marmon 34.—Harry Canup.

A drawing which we have patterned is shown in Fig. 9. The space back of the seat could be made to contain an individual folding seat for a third passenger, or could be used as a luggage-carrying department.

Spotlight on Case

Chicago—Editor MOTOR AGE—Is it possible to use a spotlight in conjunction with the lighting system of a Case 40, 1916 model? If so, give full particulars how to attach the same.—M. L. Star.

Refer to the wiring diagram in Fig. 11. A wire can be run from the dash fuse terminal of the switch, which is located under the driver's seat, as shown in the print, to the terminal of the searchlight, and the other terminal of the searchlight being grounded. If, however, the searchlight is provided with a switch, instead of

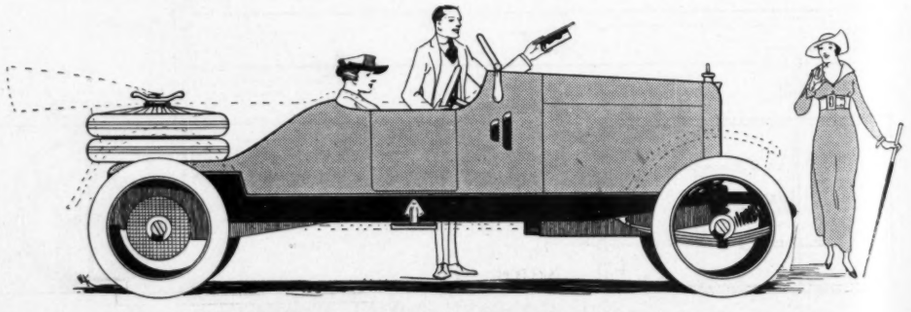


Fig. 9—Two-passenger body designed for Marmon 34

taking the lead from the dash the lead should be taken from the tail-light terminal as shown by dotted lines in the drawing.

ADJUSTING CLUTCH OF 1916 VELIE

Can Get at Screws by Removing Hand-Hole Plate

San Antonio, Tex.—Editor MOTOR AGE—How can I adjust the clutch for high speed in a 1916 Velie touring car? With the clutch or gearshift lever in the high speed notch, the car will not travel in proportion to engine speed.—J. A. Just.

To adjust the clutch on this car the hand-hole plate on the flywheel housing must be removed by taking out the four screws which hold it in place. This will expose two set screws or studs to view, located at diametrically opposite points on the clutch. These can be located by turning the engine over slowly until one of the studs comes to the top. Give each stud a half turn to the right, after having first depressed the clutch pedal to throw out the clutch. The car can now be taken out on the road to see if the trouble has been remedied. If the clutch still slips it will be necessary to give the adjusting screws another half turn or so. It may be that the clutch plates have become gummed with oil and in this case kerosene should be squirted in the clutch by means of a squirt gun. There is a plug in the bottom of the clutch housing which should be removed when the car is in operation, as the excess oil and grease will find its way out of the housing and not get into the clutch.

HAYNES LOSES POWER ON PULL

When to Change Oil in Gearbox and Differential

Jewell City, Kan.—Editor MOTOR AGE—My 1917 model 36 Haynes seemed to lose power or hesitate on a quick pull. I ground the valves and found the stems badly carboned for an inch or more. Is this a common occurrence in this engine and what will prevent it?

2—How often should the oil in gearset and differential be changed as to number of miles?

3—The regular tire equipment is 34 by 4. Would an oversize 35 by 4½ make for greater power or speed?

4—The right headlight does not burn brightly, although I have tried different bulbs, and all connections are tight. Where does the trouble lie?—F. V. Kreamer.

1—It is possible that the air valve on the carbureter of this car is stuck at times and does not operate properly, thereby causing excessive carbon to accumulate in the combustion chamber, or it may be that the valve timing is incorrect, thereby allowing the valves to be in a raised position when the different cylinders fire, which would of course account for the carbon accumulation on the valve tappets, although a person could of course expect to find a reasonable amount of accumulation even under the best motor operating conditions. The carbon on the valve stem, as long as it does not cause sticking, is in itself, of no consequence.

2—The gearbox should be drained approximately once every 4000 miles and cleaned thoroughly with kerosene. This is also the approximate mileage at which the differential should be drained.

3—No. Greater comfort to passengers and greater tire mileage would result.

4—It is focused incorrectly. The bulb and its holder can be moved back and forth. Place the car about 50 ft. from a wall, turn off the left bulb and move the right bulb back and forth until the best light is obtained.

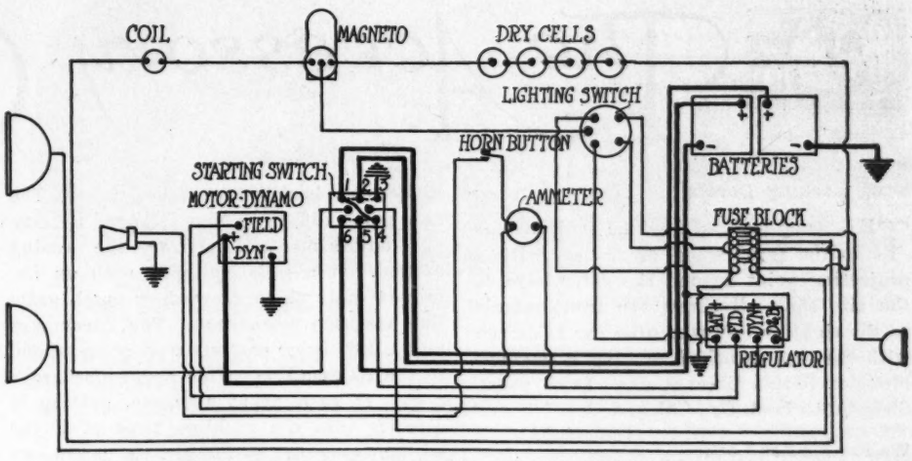


Fig. 10—Wiring of Simms-Huff system as used on 1915 Maxwell 25

ZENITH CARBURETER ON A HUPP

Idling Adjustment Is One Reader Refers To

Peebles, Wis.—Editor MOTOR AGE—Do bulbs consume more current when they become old or slightly black?

2—There is only one adjustment on my Zenith carbureter. Which way should I turn the knurled screw to get a rich mixture?

3—Is the Zenith carbureter considered superior or as good as the Rayfield carbureter?

4—Does the Spartan motor driven horn consume more current than the vibrator type horn?—Ellis C. Johnson.

1—We do not believe that used bulbs will consume any more current than new ones, but of course the quality of light secured from the same amount of current consumed is very much inferior.

2—The adjustment of the Zenith carbureter to which you refer is only for idling. This is merely to secure a smooth running engine in idling position and when the small knurled nut with its skirt attached is screwed up, or to the left, while looking down on the nut, the quantity of air is decreased.

3—One of the big features of the Zenith carbureter is its automatic action. It is immune from the various ills caused from the fact that the average garage man will attempt immediately to adjust the carbureter for almost any ill which may occur. The adjustment of the Zenith carbureter is obtained by installing smaller or larger jets or a compensating jet. These jets are carried in stock by Hupmobile dealers or Zenith carbureter branches. We do not, of course, wish to bring out any particular comparison in equipment, but would advise that the Hupmobile engineering department has found the Zenith carbureter to be the best under all conditions for the Hupmobile, and we, therefore, advise that this carbureter only be used.

4—The Hupp company has not, at any time, used the Sparton or a motor-driven horn, but would advise that the vibrator horn used will draw about 1½ amp.

1915 Maxwell Wiring

Osage, Iowa.—Editor MOTOR AGE—Furnish a wiring diagram for the Simms-Huff starter and generator as used on a 1915 Maxwell 25 car, showing how all connections are made for starting and lighting.—A. J. Evans.

The wiring diagram is shown in Fig. 10.

Oil Leak in Buick

Troy, Ala.—Editor MOTOR AGE—There is an oil leak in the crankcase of my Buick D-45. I am unable to keep the oil above the level of the pet cock gage, as it will leak, no matter how often I fill. I have had a new washer put in around the pet cock gage; also a new bushing around the crankshaft at the timing gears in front. A small amount of heavy oil still leaks out at the front, but the main leakage is in the dust pan and runs out at the rear and this is motor oil from the crankcase. I have been able to get only around 30 mi. to the quart, while others are getting 250.—George Rainer.

We would suggest that you examine carefully the drain plug in the bottom of the lower crankcase, the joint between the upper and lower halves and the joint between the lower half of the crankcase and the timing gear housing.

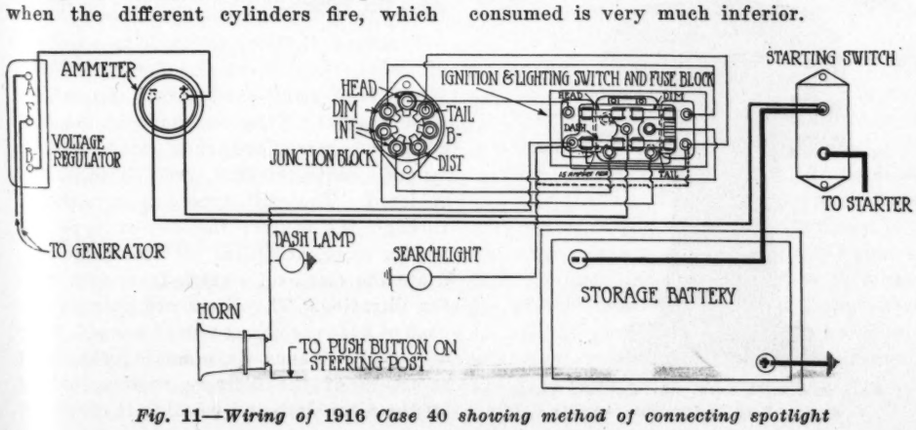


Fig. 11—Wiring of 1916 Case 40 showing method of connecting spotlight

The Accessory Corner

Sweg Locking Device

THE Sweg lock is a device that fastens to the front wheel of the car with a projecting point beyond the outer edge of the tire that wil throw the front wheels to the right or left whe nthe car is driven with the lock attached, making it impossible to drive in a direct course. Price, $3.50. Sweg Auto Lock Co., Chicago.

Walker Ke-Les Lock

The Walker Ke-Les lock cuts off the gasoline, the battery, the magneto and the self-starter by a turn of the wrist. It is operated by a three-number combination. The device has eleven parts, none of which can get out of order, it is said. As its name signifies no key of any kind is used. The lock can be installed on any car, gasoline, electric or steam and sets flush with the dash or instrument board. Price $10, installation, $5. Walker Ke-Les Lock Co., Chicago.

The Rees Jack

With only four working parts, the simplicity of the Rees jack is apparent. To operate, the handle, called the Klock Key, is turned to right to raise load and to left to lower load. The jack automatically locks securely at all points. It has no springs to get out of order and is made of strong materials. Operation at various angles is made possible by the universal joint on the handle, which is a long folding handle that is collapsible and fits in the tool box. It is claimed that the car can be raised from a hair's breadth to 6 in. without effort. The Service Corp., Pittsburgh, Pa.

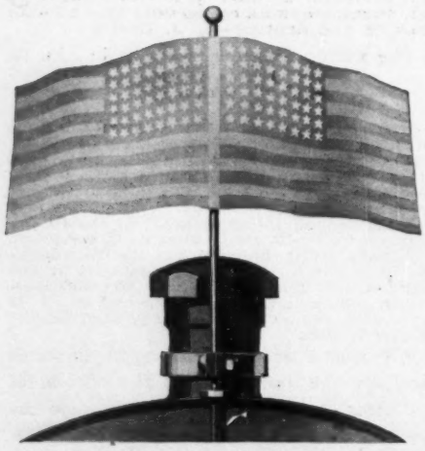
Two New Bowser Pumps

S. F. Bowser & Co., Inc., Fort Wayne, Ind., have brought out two new pumps, one of which, 241, is an improvement over the Red Sentry heretofore on the market. The new pump differs in that it opens by simply unlocking and sliding the casing around. It also is equipped with an improved dial, which shows how much gasoline has been discharged. The Pacemaker pump, 107, is an entirely new pump added to the Bowser line. This pump discharges 2 gal. of gasoline at a stroke, putting it directly into the gasoline tank of a car without exposure to the air. A gallon can be drawn as easily as 2 gal. if desired, and the dial indicators show both operator and customer just how much has been pumped.

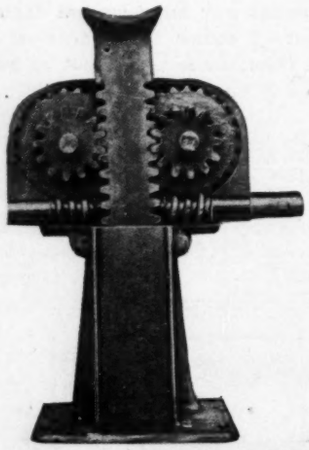
Warner Lumber Trailer

The Warner Mfg. Co., Beloit, Wis., has brought out a lumber trailer with a capacity of 2500 lb. The Warner cushion hitch is used, and the coupling allows for every position of car and trailer. The body is 8 ft. long, 46 in. wide and has stakes 30 in. high. Semi-elliptic springs, 2-in. R. D. axle, roller bearings and two 34 by 4½ pneumatic D. R. 36 by 3 solid tires are included in the specifications. The shipping weight is 1135 lb. Price, $240.

New Bowser pump 107 that discharges 2 gal. at one stroke



Auto Spin flag attachment, which holds two flags on radiator



Rees jack with only four working parts and a long, collapsible handle

Simplex Oil Filter

In splash systems crankcase and other methods of lubrication the oil becomes filled with gritty carbon, metal wearings, etc., which grind out and abrase the bearing and wearing surface unless purified or renewed at times. The Simplex oil filter is designed for this purpose. It is readily set up and put into operation by screwing the attachment plug into any convenient lamp socket. The electric solenoil-heating jacket has connections for either high or low power magnetic flux in combination with high and low energy heat. The oil percolates through strainer walls and screening material, descending through the feed pipe and spreeding-toe to the clarifying chamber, after which it goes to the filtering receptacle and on to the clean oil reservoir, whence it is delivered. Famous Filter Co., St. Louis, Mo.

Corner Signaling Device

A reversible arrow that points to the left or right as the operator desires, through solenoid magnets, has been invented by J. F. MacDonald of Billings, Mont., and is to be placed on the market soon at $10, according to its maker. The device is 10 by 4 in. and is attached to the windshield by a clamp, preferably to the left side. It is visible at a distance of from 50 to 100 ft., being a bright red. When the arrow is not in operation it disappears. The indicator will be operated by two buttons on opposite sides of the wheel or steering post. The only breakable parts are the flashlight globes, to be used to show the signal at night. The device is operated by battery current.

Sims Oil Filters

The Sims oil filters are made in a variety of sizes, the smallest size being designed for users of small powerplants, gas or gasoline engines. They are made of the best grade of galvanized sheet iron, double-lapped joints, riveted, well braced and soldered. The unit type has a partition through the center; the duplex type has two or more, according to size; these separate the clean oil section from that used for filtration. The filters are painted one coat of heat proof and two of enamel. They are easily cleaned by removing the inner structure of the filtering section, taking off the filter cloth and washing it carefully,

cleaning the cylinder, cones and pipe and removing the dirty water. Prices vary from $10 to $250 according to size.

Canti-Coil Spring Suspension

The Canti-Coil universal lever spring suspension is an application of the cantilever principle in combination with horizontally disposed coil springs. The load is carried by the horizontal springs, operated by a free swinging lever at a ratio of about 3½ to 1, connected solidly to the axle at one end and to the frame at the other end by a large universal bearing, allowing free movement at the axle end without imparting vertical shock or applying any lifting force to the frame or body. The springs are applicable to all cars. Reading Chassis & Motor Co., Reading, Pa.

Spranger Wire Wheel

The Spranger wire wheel for Ford and Chevrolet cars features a demountable rim construction. Four wire wheels and an extra rim constitute a set. The demountable rim is attached to the channel of the steel rim by six bolts and lugs locked in openings cut in the channel. These distribute evenly the driving strain and prevent the rim from working out of the channel. Prices—Ford set in black, $42.50; in red, green or canary, $44; white, $46.50; Chevrolet in black, $50; in red, green or canary, $52; in white, $55. The Spranger Wire Wheel Co., Detroit.

Economizer Heating Device

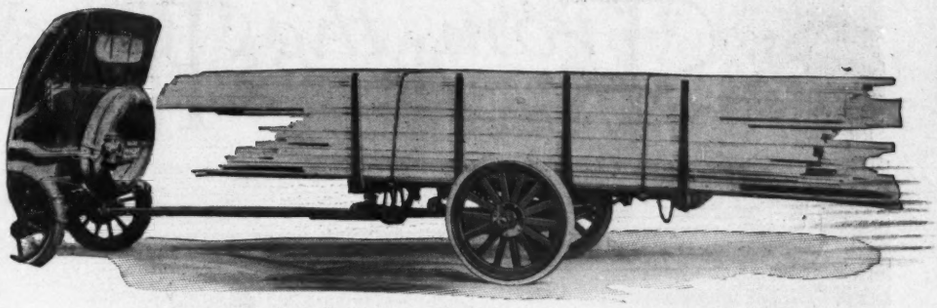
The Economizer plug is an attachment for use with the present low-grade gasoline and requires no adjustments. To attach loosen cap screws that hold the carbureter to the intake manifold, drill a 5/16-in. hole in the intake manifold, tap same with a 5/18 thread, drill exhaust manifold with 11/32 drill and tap ⅛ I. P. as close as possible to intake tube. This is to direct the heat from the exhaust manifold to the plug in the shortest course. The elbow is screwed in the exhaust manifold and the plug in the intake manifold. Shellacking insures airtight connection. Economizer Sales Co., Chicago.

Service Wheel Installation

The Service demountable wheel installation for the light car comprises four flanged threaded sleeves placed over the original wheel hubs, which drive the wheel through six flange studs. The original wooden wheels are bored out to fit the flanged hub and are held in place by a threaded flange and hub cap. A spare wooden wheel is included in the set, which costs, complete, $20. Service Auto Wheel Co., Grand Rapids, Mich.

Dutch Brand Accessories

The Dutch brand of accessories, made by Van Cleef Bros., Chicago, covers a wide range of cements, enamels, chemical specialties, lubricants, etc. Among its best sellers are a radiator seal compound that repairs instantaneously and permanently leaky radiators, a gasket shellac to cement and make free of leaks metal, leather, cork, paper, asbestos, canvas, fiber, rubber and all varieties of gasket used in motor car, motorcycle and all types of gasoline and oil engines; and a valve-grinding compound for grinding-in valves and general polishing. New labels and lithographed packages add to the attractiveness of the line. The rubber and rim cements are of the finest grade of pure Para rubber combined with the highest quality chemicals obtainable. All the manufacturing is done in a thoroughly modern plant under the direction of one of the members of the firm, who is an expert chemist. A patented system of closure guarantees the tubes used against leakage and evaporation.



This lumber trailer brought out by the Warner company has a capacity of 2500 lb.

The Motorists' Bookman

The Spell of Scotland

Old Scotland as a land of romance fills the pages of this number of the Spells series, in which Scottish history and topography are treated. About half the space is given to Edinburgh and its neighborhood. Prince street, with its magnificent views, prospects and height at one extremity is colored by the word brush of one who realizes its magnificance, deserving of its reputation as the finest European thoroughfare. Keith Clark emphasizes the beauty of the land, the loveliness of Abottsford, for instance, and Melrose and Dryborough, the trees and the ruins. It needs little advance on the road to consideration of the lakes, the Highlands, the border towns, the Burns country and the gaunt old castles of the feudal lords to make one realize the writer's inborn sympathy with his ancestral country. The Page Co., Boston, Mass.; $2.50 net.

A Hoosier Holiday

If one wants philosophy as well as motoring there could be no better medium for the acquisition of both simultaneously than "A Hoosier Holiday," by Theodore Dreiser, who, being one of the greatest realists of to-day, is peculiarly apt to give a true and life-like picture of a motor tour.

The trip was made by Dreiser and Franklin Booth, the pen-and-ink master, who has made liberal illustration of the 513-page book. The route was a scenic route, up the Hudson to Albany and by the perfect state roads to Buffalo, along the shore of Lake Erie to Cleveland and Toledo to Warsaw and Carmel. The motor trip was a pilgrimage in a way and as such is likely to give the reader a knowledge of the gain from the more intimate tour that includes the small town than the usual tour account might give. To appreciate, however, one must read. Price, $3. John Lane Co., New York.

Auto Spin Flag

Two American flags, shaped to form a simple wind mill, are attached to the radiator cap, forming a distinctive and patriotic ornament. The price of the flag attachment is 50 cents; of the radiator attachment, 25 cents. Wallace C. Hood Service Bureau, Detroit.

NUOLINE A GASOLINE SUBSTITUTE

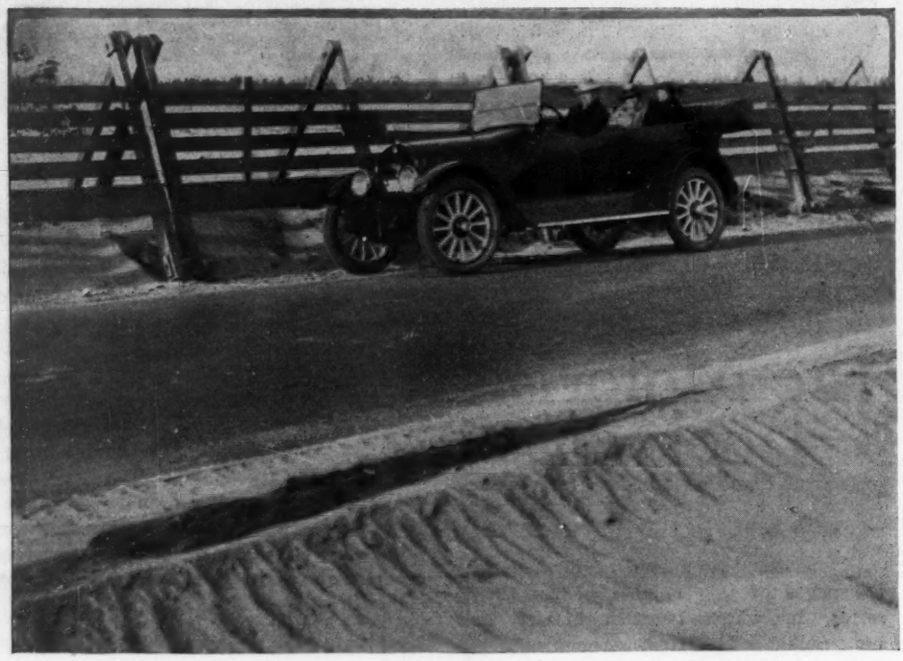
New York, June 1—Experiments are being made at the West Side Y. M. C. A. Automobile School, with a new fuel called Nuoline, put forth as a substitute to sell at 10 cents a gallon. Louis Clemont, the inventor, a Danish chemist, says the ingredients are cheap and that two-thirds of the liquid is water.

Tests of the liquid, which is a milky white, have shown it as an able substitute for gasoline. A road test of 415 miles has just been concluded, the car having been run to Albany on the east side of the Hudson and then to Schenectady and Utica, returning on the west side of the river via Newburgh and the Fort Lee ferry. The average was 11 m.p.g.

Response to the accelerator with Nuoline was much better than with gasoline. There was none of the gasoline fumes from the exhaust, but a faint odor of camphor, which was explained to be coal camphor from one of the ingredients used in the manufacture of the fuel.

A company is being organized to manufacture Nuoline commercially. The president will be Senator Robert Lawson of Brooklyn. Associated with him will be H. C. Brokaw, M. Clemont, Dr. H. O. Lehman and H. Boes.

From the Four Winds



FENCING SANTA ANA OFF THE ROAD—Santa Ana is a wind. It blows so unceasingly and hard motorists in California have a hard life on the Foothill boulevard. The board fence is necessary to keep the sand from drowning the boulevard. It is set at an angle and weighted with bags of cement

NEW Highways to Be Wide—Under the new road improvement act, which provides for $15,000,000 worth of paved roads in New Jersey, the width of the highways has been set at 30 ft., with an 18-ft. pavement.

Park Gives Camping Sites—Motorists passing through Arbuckle, Cal., this season will find excellent camping grounds at the Balfour Park. The chamber of Commerce has thrown the park open as a camping place. Water has been piped to the park and camp shelters have been erected.

Texas Road Work Hampered—Officials throughout this state are afraid the war will hamper road work, for the reason that road bonds cannot be readily disposed of. Many bond issues, voted within the last few months, and there have been more than ever before for the same length of time, are unsold.

Wisconsin Sees New License Record—Wisconsin is practically certain of breaking all previous records for registrations, the total of which at the middle of May was in excess of 118,000, compared with 61,000 at the same date a year ago. The entire registration by private owners during 1916 was 115,000. For 1917 it is expected to exceed 175,000 at the present rate.

New Commissioner for Connecticut—Connecticut now has a new motor vehicle law and a commissioner to handle the department. Robbins B. Stoeckel is the commissioner and he has appointed John MacDonald as his deputy. The new law has a lot of extracts from the old law, but there are some new sections relating to operation, penalties, etc. The commercial vehicle fees have been increased, but the passenger car registrations are still 50 cents per horsepower. Some limitations have been placed upon the dealers, and the non-residents are not limited to any specific number of days. The motor vehicle commissioner has broad powers to suspend licenses and give hearings, but any motorist may appeal from his decision to the judge of a superior court.

Long Tour on Silver Wedding—Mr. and Mrs. O. E. Aultman and son, of Denver, are making an extensive tour of the country in their Velie. It is Mr. and Mrs. Aultman's silver honeymoon. They decided years ago to make a long tour this year, and they have already covered 3,600 miles.

Overland Makes Western Coast Record—An Overland driven by L. J. Kearns, sales manager of the Overland-Pacific branch in Seattle, Wash., has set a new high mark on the Seattle-Portland highway. With an actual running time between Puget Sound and the Columbia river of 5 hrs. and 9 mins., the Overland established a record of 195.1 miles.

Fire Car Celebrates Fifth Year—Marathon Kate has celebrated her fifth year in the service of the Grand Rapids, Mich., fire department. The name is explained by precedent. Fire Marshal George Boughner used to have an official horse instead of an official car, and this was the horse's name. Not only has the car, a Jackson, transplanted the horse, but it has retained the name. Marathon Kate has driven to 30,000 miles of fires.

Western Washington Motorists Organize—The Automobile Club of Western Washington has been formed. It is to include every motor club in the counties west of the Columbia river. The individual clubs will be absorbed by this new organization, which it is hoped will have a membership of more than 10,000. Its activities will be devoted primarily to the promotion and encouragement of good roads. Signs will be erected on the main and scenic highways; road maps will be issued and touring information given out. The headquarters will be in Seattle. Information bureaus will be conducted in each of the cities of western Washington where more than 100 members are located.

New York Cars at Fashion Show—A motor fashion show will be held at the Sheepshead Bay speedway June 23 in behalf of the Actors' Fund of America. Prizes will be awarded by a jury composed of newspaper men to the most fashionable combination of car and entrant. Entries are to be limited to 100.

St. Louis Rounds Up Motorists—Sixty-four motor car drivers were fined $5 and costs at St. Louis one day as a result of a round-up by the police department's flying squadron in the West End. Of the arrests, forty-five had no tail-lights, five had dazzling headlights, four had no lights and ten were speeders.

Oregon Provides Camp for Motorists—A free camping park for motorists has been established at Husum, Ore., on the White Salmon river. Stone fireplaces have been arranged for cooking, and free fuel will be supplied. Parking facilities for cars under cover or adjacent to the park, also have been arranged.

Michigan Shows Used Cars—The first used car show ever held in the Upper Peninsula of Michigan was at Calumet, Mich., May 15-17. About 100 cars were exhibited and sales were satisfactory. The show was managed by Copper county dealers, and admission was free. An auction was held once a day.

License Fees to Repair Roads—The $1,800,000 received during 1917 by the New Jersey motor vehicle department for registrations, fees, fines, etc., will be apportioned out to the twenty-one counties for road repairs. Next year this fund will be used for construction of new roads. A patrol system will cover all improved roads of the state as soon as the new construction has been finished.

Bay State A. A. Plans Run—The board of directors of the Bay State A. A. has voted to hold its annual outing as usual this year and to call it "The Prosperity Run." It will take place June 16, 17 and 18, and the motorists will go from Boston to the Farragut House at Rye Beach, where they will have a ball, outdoor sports and banquet. Officers of clubs in other cities have been invited to join in the run.

Motorists Prepare Camping Site—About fifty motorists gathered at the new tourists' park on Feather river, Oroville, Cal., May 5 to assist in preparing the park for the summer tourists. Roads leading to the park have been put in condition, and carpenters have been busy building camping shelters. Water has been piped to the park, and it is claimed that the camp is one of the finest on the Pacific coast.

Denver Prepares for Another Show—A big motor show some time within the next year is now assured Denver by unanimous vote and active planning of the Automobile Trades Association of Colorado. Whether to hold the event in the fall, as originally planned four months ago, or to postpone it until next winter or spring because there has already been one show here this year, has not yet been decided. A special committee is now investigating the situation. The chairman of the committee is Charles Henry, Jr., manager of the local Ford assembling plant.

Among the Makers and Dealers

FAGEOL to Build—The Fageol Motor Car Co. will start construction of its factory in June, which will be erected at a cost of $1,000,000.

Machine Tool Company Expands—The Niles-Bement-Pont Machine Tool Co., Plainfield, N. J., has completed a large addition to its plant and started another to cost $25,000.

Maccar Increases Production Facilities—The Maccar Truck Co. has completed plans for a new factory at Scranton, Pa., which will be ready in five months and will afford production of 1500 trucks a year.

Globe Truck Makes Two Appointments—W. F. Sheehan has been appointed general manager of the Globe Motor Truck Co. C. T. Schaefer has become chief engineer. He was formerly chief engineer of the Mogul Truck Co.

Pathfinder Stock Is Offered—A. R. Sheffer & Co., Detroit, are offering to the public stock of the Pathfinder Co., Indianapolis. The company's 7 per cent preferred stock carries the right to buy the common stock at $2.50 with a par of $10.

Sexton Oil Opens New Plant—The Sexton Oil Co. has opened its new factory at North Chicago, which gives it a capacity for 300,000 gal. a week without double shifts. The old plant will be retained as a warehouse and local distributing point.

Gryphon Rubber & Tire Elects—The Gryphon Rubber & Tire Corp., New York, has elected the following officers: President, Norman W. Peters; vice-president and general manager, A. E. Gordon; secretary, A. G. Vellek, and treasurer, S. A. Cunningham.

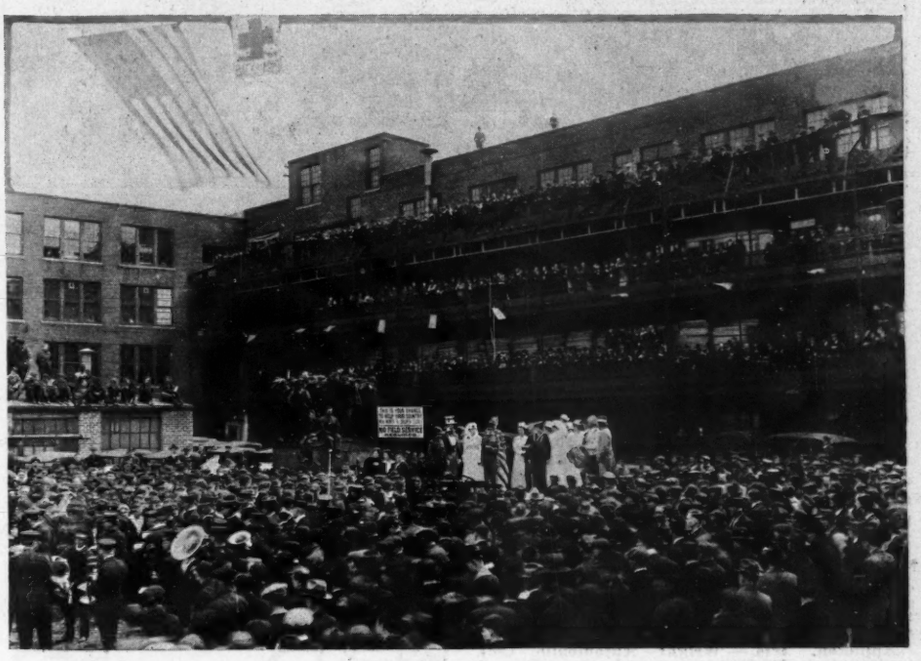
Wilson Helps Direct Harroun Traffic—Nicholas Wilson has been appointed assistant traffic manager of the Harroun Motors Corp. He was at one time assistant traffic manager in the E-M-F Co. and has also been with the Studebaker and Maxwell companies in similar positions.

Cadillac Truck Increases Capital—The Cadillac Auto Truck Co., Cadillac, Mich., has authorized the issuance of $130,000 of additional stock, increasing the capitalization of the company from $200,000 to $300,000. The concern's business has increased threefold during the last three months.

Maxwell Earnings Increase 58 Per Cent—Sales of the Maxwell Motor Co. during the first three months of 1917 were more than 58 per cent larger than in the corresponding period of the preceding year. The total for the quarter was 19,000, an increase of 6968 over the first quarter of 1916.

Westinghouse Increases Employees' Wages—The Westinghouse Electric & Mfg. Co. has granted its employees an advance of 10 per cent in wages. This raise brings the total increases during the last two years to about 40 per cent. The company also is subscribing to the Liberty Bond issue so the employees can buy bonds in small monthly or semi-monthly installments.

Blevins Sells Studebaker Interests—Harry W. Blevins has sold his interests in the Studebaker Sales Co. to A. R. Davis and associates. The Studebaker Sales Co., of which Mr. Blevins was president, was incorporated last summer for $500,000 to take over the business of the Blevins Auto Sales Co. with branches in Toledo, Columbus, Dayton and Cincinnati; the S. R. Davis Co., Cleveland, and the Aaron DeRoy Motor Co., Pittsburgh.



STUDEBAKER EMPLOYEES RALLY 'ROUND THE FLAG—This picture was taken when 2,000 Studebaker employees held a noon flag rally and patriotic demonstration. The entire factory force contributed to the Red Cross fund

Coming Motor Events

CONTESTS
—1917—

June	16	Chicago, speedway.
July	4	Visalia, Cal., road race.
July	4	Spokane, Wash., track.
July	4	Benton Harbor, Mich., track
July	4	Uniontown, Pa., speedway.
July	4	Tacoma, Wash., speedway.
*July	4	Omaha, Neb., speedway.
July	14	Rochester, N. Y., hillclimb.
July	15	Missoula, Mont., track.
July	17-19	Intercity Reliability.
July	22	Anaconda, Mont., track.
July	29	Great Falls, Mont., track.
Aug.	5	Billings, Mont., track.
Aug.	17	Flemington, N. J., track.
*Sept.	3	Cincinnati, Ohio, speedway.
Sept.	3	Uniontown, Pa., speedway.
Sept.	6	Red Bank, N. J., track.
Sept.	8	Pike's Peak, Colo., hill climb.
*Sept.	15	Providence, R. I. speedway.
Sept.	22	Allentown, Pa., track.
Sept.	28	Trenton, N. J., track.
*Sept.	29	New York, speedway.
Oct.	6	Uniontown, Pa., speedway.
Oct.	6	Danbury, Conn., track.
*Oct.	13	Chicago, speedway.
Oct.	13	Richmond, Va., track.
Oct.	27	New York, speedway.

* A. A. A. Championship Award Event.

MEETINGS

June	25-26	Washington, D. C., S. A. E. midsummer.

SHOWS

June	20-27	Montreal used car show.
Aug.	6-18	Fremont, Neb., tractor demonstration.
Sept.	9-15	Spokane, Wash., Interstate fair.
Sept.	2- 9	Milwaukee show, State Park fair, West Allis.
Oct	13-28	Dallas, Tex., state fair.

The business will be conducted along the same lines with general offices in Cleveland.

Scholl Gets Splitdorf Promotion—H. W. Scholl, for the last four years on the sales force of the Splitdorf Electrical Co., Newark, N. J., has been appointed Eastern representative.

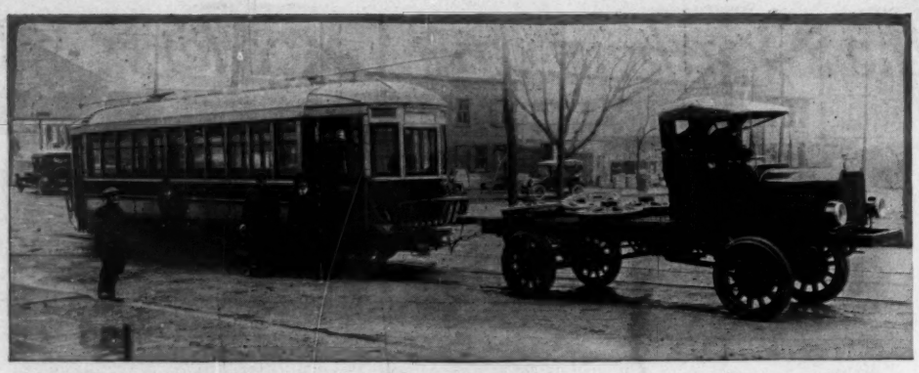
Franklin Makes New Production Record—The Franklin Automobile Co., during the week of May 19, received more orders than in any previous week in its history. Factory production reached a new high mark, 216 cars being turned out in 5½ working days.

Aprahamian Back from South Africa—A. Aprahamian, foreign representative for the Ospeco Mfg. Co., has returned from a business trip to South Africa. Mr. Aprahamian expects to leave for an extended trip through Australia and New Zealand soon.

De Lion Tire to Build—The De Lion Tire & Rubber Co., Trenton, N. J., is having plans prepared for a second-story addition to its plant, 50 by 112 ft., to cost about $10,000, and for a new reinforced-concrete extension, 20 by 60 ft., to cost $7,000.

Drawe Becomes Mutual Treasurer—G. E. Drawe, assistant general manager of the Mutual Motors Co., has been elected a director and also treasurer of the company, succeeding W. T. Miller, former treasurer, duties as assistant general manager along who has resigned. Mr. Drawe will retain his old position also.

Goodyear Cotton Mills Expand—So successful has been the production of the Goodyear cotton mills at Goodyear, Conn., that the plant is being doubled in capacity and area. Among the new buildings is a large storehouse with a capacity of 10,000 bales. The bales are opened in this building and the cotton blown by a gigantic fan through a



DUPLEX TRUCK PULLS TROLLEY CAR UP HILL—A Duplex 3½-ton truck towed a street car, weighing 25 tons and carrying ten passengers, up State Street hill in the rain at Harrisburg, Pa. It was a demonstration before the railway officials

tunnel to the point where its transformation into tire fabric is begun.

Chalmers Promotes H. G. Stewart—H. G. Stewart of the Chalmers Motor Co. factory staff has been made service manager at the New York Chalmers branch.

Revere Production to Start July 15—The Revere Motor Co., Logansport, Ind., has announced it will begin production of the new Revere car July 15. The company has bought a factory site, and work on a plant will be started within the next two weeks. Adolph Munson and Gil Anderson are assisting in designing the car.

DeOrlow Leaves Woods Vehicle—S. O. DeOrlow has resigned as engineer of the Woods Motor Vehicle Co., to become chief engineer of the Oak Mfg. Co.

New Company to Make Seat Covers—A factory for the manufacture of motor car seat covers, dust hoods, tire covers, engine and radiator hoods and other fabric accessories, will be established at Little Rock, Ark., under the direction of S. A. Myar, vice-president of the Henry W. Myar Co. Mr. Myar will be president and general manager of the new firm.

Russell Joins Farrar & Trefts, Inc.—Henry F. Russell, formerly with the Lumen Bearing Co., has been appointed sales manager of the gray iron foundry department of Farrar & Trefts, Inc., Buffalo, N. Y.

Ford Takes Agricultural Census—The Ford Motor Co., co-operating with the food preparedness board of Michigan, has distributed cards throughout its plant and is listing all workers available for harvest work.

Stover Raises Employees' Wages—The Stover Mfg. & Engine Co., Freeport, Ill., engaged in the construction of tractors, announced a 10 per cent increase in wages, effective June 1. About 800 men are affected. It is estimated that the increase will cost the company about $50,000 per annum.

Lehman Moves into New Plant—The removal of the Lehman Mfg. Co., Cannelton, Ind., maker of Lamco speed bodies, into a new plant will enable it to make deliveries on its Clover Leaf and commercial line of bodies in about three weeks. They also will turn out a complete line of gasoline and oil tanks and bucket seats. They now are making deliveries on speed bodies for Ford, Maxwell, Overland and Saxon cars.

Recent Incorporations

Akron, Ohio—Pioneer Rubber Specialty Co.; capital stock, $25,000; to manufacture rubber specialties; incorporators, Burt G. Smith, Jefferson D. Slater, Jesse P. Dice, V. M. Huggins and Charles M. Chapman.

Appleton, Wis.—Wright Automobile Co.; capital stock, $15,000; to engage in the selling of new and used cars, operate a garage, etc.; incorporators, Frank Wright, A. M. Wright and M. McInerney.

Bethany, Neb.—Bethany Garage Co.; capital stock, $10,000; incorporators, J. S. Tewksbury and E. H. Rice.

Boerne, Tex.—Richter Auto Co.; capital stock, $5,000; incorporators, Arno Richter, Harry Richter and Mack Richter.

Canton, Ohio.—Canton Rim Co.; capital stock, $100,000; incorporators, William P. Beardsley, A. R. Turnbull, Henry R. Bauhof, Grover C. Allison, John G. Smith and Thomas Llewellyn, Jr.

Chicago—Serlin Tire Co.; capital stock, $10,000; incorporators, W. F. Stapleton, S. B. Epstein and E. D. Johnson.

Chicago—Servall Garage Corp; capital stock, $100,000; incorporators, H. J. Ryner, W. E. Berstch and John H. Crow.

Cincinnati, Ohio—Columbia Motor Sales Co.; capital stock, $10,000 to sell motor cars incorporators, Morris James Dale, Ben B. Dale, C. B. Stubert, Ralph E. Sudler and R. M. Atkina.

Cleveland, Ohio—Gilman Motor Trucking Co.; capital stock, $25,000; to sell motor cars; incorporators, H. F. Gilman, A. C. Gilman, F. M. Gilman and Carlton F. Schultz.

Cleveland, Ohio—Oberlin Motor Truck Co.; capital stock, $1,250,000; incorporators, W. M. Oberlin, J. C. James, H. S. Ballard, Edna Alexander and J. J. McKnight.

Cleveland, Ohio—Euclid Garage Co.; capital stock, $10,000; to operate a garage; incorporators, Alonzo M. Snyder, Horatio Ford, L. B. Davenport, G. M. Reilly and N. I. Young.

Cleveland, Ohio—Uneedit Sales Co.; capital stock, $25,000; to sell accessories; incorporators, Austin C. Sayler, Edward J. Quigley, A. Z. Wheeler, C. A. Myers and Thomas F. Turner.

Cleveland, Ohio—Hough Ninety Third Garage Co.; capital stock, $15,000; to operate a garage; incorporators, T. H. Bushnell, A. R. Dorn, Edward J. Cherney, H. P. Altman and V. L. Galinatt.

Cleveland, Ohio—Lock-Fast Mfg. Co.; capital stock, $5,000; to sell accessories; incorporators, Lad E. Krejci, Martin L. Sweeney, William A. Thomas, John G. Murphy and William J. Klotzbach.

Cleveland, Ohio—Cleveland-Halliday Co.; capital stock, $15,000; to sell motor cars; incorporators, Harry M. Long, Dallas E. Hadley, William H. Waterman, A. A. Wieland and William A. Moran.

Columbus, Ohio—Paramount Motor Co.; capital stock, $100,000; incorporators, Jesse F. Hatcher, Edmund B. Hatcher, George V. Rottweiler, Alexis Cope and Thomas H. Ricketts.

Dallas, Tex.—Peavey Rubber Co.; capital stock, $100,000; incorporators, Ralph A. Peavey, N. P. Deavoroux and E. W. Ware.

Dallas, Tex.—Tenison, Frey & Hardy Automobile Co.; capital stock, $30,000; incorporators, E. C. Tenison, Jerrey B. Frey and J. V. Hardy.

Dennison, Texas—Hardy, Frey Automobile Co.; capital stock, $30,000; to handle cars; incorporators, J. R. Tennison, Jere B. Frey and J. V. Hardy.

Des Moines, Iowa—Auto Salvage & Exchange Co.; capital stock, $50;000; incorporators, O. B. Van Hoessen and F. W. Newton.

Detroit, Mich.—Progress Auto Equipment Co.; capital stock, $50,000; incorporators, Carl Torgl, O. H. Schnepper and Herman A. Schmidt.

Detroit, Mich.—Oliver Auto Device; capital stock, $100,000; to manufacture new motor car novelties; incorporators, William E. Metzger, D. S. Oliver and H. H. Crawford.

Edgerton, Wis.—Highway Trailer Co.; capital stock, $180,000; to manufacture and market motor car trailers, auxiliaries, etc.; incorporators, James W. Menhall and others.

El Paso, Tex.—Merchants Auto Express Co.; capital stock, $20,000; incorporators, M. L. Naquin, John B. Clifford and E. A. Young.

Fort Worth, Tex.—Beale Auto Supply Co.; capital stock, $7,000; incorporators, C. W. Beale, L. B. Isaacs and B. L. Agerton.

Georgetown, Tex.—Irrigation Auto Co.; capital stock, $10,000; incorporators, T. S. Gaswell, J. V. Rowlett and J. M. May.

Georgetown, Del.—Rotary Gas & Steam Motor Corp.; capital stock, $50,000; incorporators, Charles W. Cullen and Albert Worth.

Graham, Tex.—Graham Electric & Auto Co.; capital stock, $27,000; incorporators, J. E. Dowdle, W. F. Babb and B. P. Walker.

Hackensack, N. J.—Chimock Tire & Rubber Co.; capital stock, $250,000; incorporators, Cornlys A. Cole, Arthur R. Oakley, Paul E. Britsch.

Huntington, W. Va.—Interstate Motor Bus Co.; capital stock, $50,000; incorporators, Gus. M. Hodges, S. H. Mallory, C. D. Miller, H. T. Lovett and J. D. Tunning

Lafayette, Ind.—Mills Electric Co.,; capital stock, $100,000; to manufacture a light electric motor-driven car to be used on board walks and at pleasure resorts; incorporators, Bryon J. Mills, Herbert A. Keller and Eldon L. Lewis.

Milwaukee, Wis.—State Garage & Trucking Co.; capital stock, $5,000; incorporators, Henry A. Woller, G. A. Dick and Harold E. Hoyd.

Milwaukee, Wis.—Metal Spraying Co.; capital stock, $25,000; incorporators, Francis A. Vaughan, Emmett A. Donnelly and E. J. Hixley.

Milwaukee, Wis.—Badger Tool Co.; capital Clemens, Amos L. Conn and M. E. Thompson. stock, $5,000; incorporators, Nesse C. Nelson, J. W. Reichert and Gusave O Teske.

Milwaukee, Wis.—Ziola Mfg. Co.; capital stock, $20,000; to manufacture electrical devices, machinery, appliances, etc.; incorporators, Theodore H. Rolf, E. W. Bentzien and W. A. Ziola.

Milwaukee, Wis.—Monson-Inbusch Automobile Co.; capital stock, $6,000; to deal in new and used cars, operate a garage, etc.; incorporators, Michael J. Monson, Ralph C. Inbusch and H. C. Loeffler.

New York—Apex Auto Sales Co.; capital $25,000; incorporators, Robert E. Lent, Eva E. Lent and Euphrates R. Lent.

New York—Gramercy Park Garage; capital stock, $10,000; motor cars, operating ragares, etc.; incorporators, Cyrus C. Bull, David G. Wakeman and William J. Doyle.

Oklahoma City, Okla.—Elliot Motor Co.; capital stock, $10,000; incorporators, C. S. Elliot, A. I. Corbin and C. F. Thompson.

Oklahoma City, Okla.—Scott Auto and Supply Co.; capital stock, $15,000; incorporators, William Scott, James H. Scott and E. F. McElhose.

Omaha, Neb.—Crown Tire & Rubber Co.; capital stock, $250,000; to manufacture tires and other rubber goods; incorporators, Henry A. Reichenbach, Henry C. Meier, Jesse P. Howe.

Philadelphia, Pa.—Bankers & Merchants Garage Co.; capital stock, $105,000; incorporators, F. R. Hansell, S. C. Seymour and J. V Pimm.

Pittsburgh, Pa.—Hazelwood Garage; capital stock, $10,000; incorporators, A. D. Culley, Thomas E. Burton and Henry F. Kohne.

Pittsburgh, Pa.—Sherman-Stevenson Tire & Rubber Co.; capital stock, $500,000; incorporators, Wilber A. McCoy, Pittsburgh, W. I. N. Lofland, Charles M. Jones.

Rochester, N. Y.—Dewey Motor Car Co.; capital stock, $10,000; to deal in a garage and repair business; incorporators, J. Metchenback and F. and B. C. Gerling.

San Antonio, Tex.—Johnson Motor Co.; capital stock, $15,000; incorporators, Ben H. Johnson, Russell C. Hill, San Antonio, and W. S. Langford.

Seymour, Wis.—Brandt Auto & Implement Co.; capital stock, $20,000; ncorporators, August Brandt, Louis Lorenz and H. F. Hall.

South Bend, Ind.—Security Tube Co.; capital stock, $150,000; to manufacture tires and tubes; incorporators, William P. Furey, Rae C. Blackman, Joseph W. McInerny, H. H. Haverstock and Hugh B. McVicker.

St. Louis, Mo.—McFalran Sales Co.; capital stock, $10,000; incorporators, S. Bernheimer, Winfield Graham and T. F. Sexton.

Toledo, Ohio—C. E. S. Garage Co.; capital stock, $15,000; to operate a garage; incorporators, Clyde E. Smith, George A. Bassett, Deane

Toledo, Ohio—Ludwig Tire Repair Co.; capital stock, $10,000; to sell and repair tires; incorporators, Harry Ludwig, Louis H. Sanzenbacher, Charles W. Sullivan, E. H. Krieger and Francis F. Bartelle.

Uniontown, Pa.—White Line Taxi & Transfer Co.; capital stock, $5,000; incorporators, J. W. White, Brownsville, Clyde Van Swearingen and Linn C. Phillips.

Vermillion, Ohio—Bristol Co.; capital stock, $10,000; to sell motor cars; incorporators, R. E. Bristol, O. E. Kemp, Arlo Casebere, Albert Croll and C. D. Zimmerman.

Washington, D. C.—Capital City Garage Co.; capal stock, $25,000; incorporators, Frederick Long, Patrick E. Cann, W. R. Cann, A. C. Keyser and Peter Henderson.